Ca' Foscari
University
of Venice

Master's Degree Programme

in

Comparative International Relations

Final Thesis

The Military Emissions Gap

From a global perspective to the cases of
Japan and the Republic of Korea

Supervisor
Prof. Marco Zappa

Graduand
Edoardo Quagliato
866841

Academic Year
2023/2024

Table of Contents

Acknowledgements

This thesis is the result of research work that has characterized most of my daily life for the last months.

For this, I must first and foremost thank my supervisor, Prof. Marco Zappa, for agreeing to oversee my project and guide me through the mainly unknown, difficult, and non-linear path that is academic research. His advice, critiques, corrections, and ultimately long-lasting support have been precious and fundamental for the healthy and successful delivery of this piece of work. His patience in having to deal with my stubbornness and inexperience, but at the same time granting me the chance to research such a difficult argument and constantly instilling hope and motivation in my capacities and ideas have been of immense help, in particular during the first phases of drafting, which are always the most difficult ones.

I would also like to thank prof. David Leheny as my "temporary" supervisor during my exchange period in Japan, and to all the people of the "zemi" that are currently either graduated or in the process of writing a master's thesis under his guidance: your feedback, trust, and general support of any type have contributed in giving me the necessary motivation to pursue and start this project once I returned to Italy.

One big heartfelt "thank you" to all my friends and the people I have crossed paths during my university years: I would have not been the person I am today and would have not achieved this objective the way I managed to without having met you all: sadly, it would be impossible to list all of you, so please forgive me for giving you so little space within these words. Special thanks, however, must go to Giammauro and Matteo, who both extensively read and commented on the drafts of this thesis with extreme patience, providing me with insights, suggestions and critiques.

I am immensely grateful to my grandmothers, grandads, father, mother, brother, and my sister-in-law for their continuous support and trust in my university path for all these years: this chapter of my life would have never been even remotely possible without you. It is rather difficult to express the amount of gratitude I feel towards my family. Thank you.

List of abbreviations and Acronyms

1996 IPCC GL – 1996 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories

2000 IPCC GPG – 2000 Intergovernmental Panel on Climate Change Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories

2006 IPCC GL - 2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories

APP - Asia-Pacific Partnership on Clean Development and Climate Change

AR6 – Sixth Assessment Report of the Intergovernmental Panel on Climate Change

ASEAN – Association of South East Asian Nations

ATC – Air Traffic Control

AWAC – Airborne Warning and Control Systems

AWG-DP - Ad Hoc Working Group on the Durban Platform for Enhanced Action

AWG-LCA - Ad Hoc Working Group on Long-term Cooperative Action under the Convention

AWG-PA - Ad Hoc Working Group on the Paris Agreement

BR – Biennial Report

BTR – Biennial Transparency Report

BUR – Biennial Update Report

CBDR – Common But Differentiated Responsibilities

CEOBS – Conflict and Environment Observatory

CH4 – Methane

CMA – Conference of Parties to the Paris Agreement

CMP – Conference of Parties to the Kyoto Protocol

CO2 – Carbon Dioxide

CO2 – Carbon Dioxide

COP – Conference of Parties

COrE – U.S.-Japan Competitiveness and Resilience Partnership

CRT – Common Reporting Tables

CSR – Corporate Social Responsibility

ECM – Electronic Counter Measure

EDGAR - Emissions Database for Global Atmospheric Research

EF – Emission Factor

EIT – Economy In Transition

ERT – Expert Review Team

ETS – Emissions Trading Scheme

FOIA – Freedom of Information Act

GCR – Global Climate Report

GDP – Gross Domestic Product

GHG – Greenhouse Gas

GHGI – Greenhouse Gas Inventory

HFCs – Hydrofluorocarbons

IBFs – International Bunker Fuels

ICAO – International Civil Aviation Organization

IMCCS – International Military Council on Climate and Security

IMO – International Maritime Organization

INDC – Intended Determined National Contribution

IPCC – Intergovernmental Panel on Climate Change

IPCC EFDB - Intergovernmental Panel on Climate Change Emissions Factor Database

IPCC TFI – Intergovernmental Panel on Climate Change Task Force on National Greenhouse Gas Inventories

IPCC-NGGIP - Intergovernmental Panel on Climate Change National Greenhouse Gas Inventories Program

IPPU – Industrial Processes and Product Usage

IPPU – Industrial Processes and Product Use

ISIC - International Standard Industrial Classification of all Economic Activities

JGSDF –Japan Ground Self-Defense Forces

JSDF – Japan Self-Defense Forces

KP – Kyoto Protocol

LDC – Least Developed Country

LULUCF - Land use, land-use change, and forestry

N2O - Nitrous oxide

NAZCA – Non-State Actor Zone for Climate Action platform

NC – National Communication

NDC – Nationally Determined Contribution

NF3 - Nitrogen trifluoride

NGO – Non-Governmental Organization

NIES – National Institute for Environmental Studies

NIR – National Inventory Report

NMVOC - Non-methane volatile organic compound

NSA – National Security Archive

OECD – Organization for Economic Co-operation and Development

O-LCA – Organizational Life Cycle Assessment

OSCE – Organization for Security and Co-operation in Europe

PA – Paris Agreement

PA ETF – Paris Agreement Enhanced Transparency Framework

PA NID – Paris Agreement National Inventory Document

PFCs – Perfluorocarbons

QELRC – Quantified Emissions Limitation and Reduction Commitments

R&D – Research and Development

ROK – Republic of Korea

ROK GIR – Republic of Korea Greenhouse Gas Inventory and Research Center

ROK NCCAP – Republic of Korea National Climate Change Adaptation Plan

SAF – Sustainable Aviation Fuel

SDI – Strategic Defense Initiative

SF6 - Sulfur hexafluoride

SGR – Scientists for Global Responsibility

SIPRI - Stockholm International Peace Research Institute

SO2 - Sulfur dioxide

SWOT – Strengths, Weaknesses, Opportunities, Threats

SYR SP – Synthesis Report Summary for Policymakers

TCS – Trilateral Cooperation Secretariat

TEMM – Trilateral Environment Ministers Meeting

TJAP – Tripartite Joint Action Plan

TSU – Technical Support Unit

TSU – Technical Support Unit

U.S. DLA-E – United States Defense Logistics Agency – Energy

U.S. DOD – United States Department of Defense

U.S. DOE – United States Department of Energy

UN – United Nations

UNEP – United Nations Environment Program

UNEP EGR – United Nations Environment Program Emissions Gap Report

UNFCCC – United Nations Framework Convention on Climate Change

UNFCCC MRV – United Nations Framework Convention on Climate Change Measurement, Reporting, and Verification System

UNFCCC SBI – United Nations Framework Convention on Climate Change Subsidiary Body for Implementation

UNFCCC SBSTA – United Nations Framework Convention on Climate Change Subsidiary Body for Scientific and Technological Advice

UNGA – United Nations General Assembly

UNSD - United Nations Statistics Division

WG – Working Group

Abstract

Climate Change is the single most difficult collective action problem humans have ever faced to date. It has already been more than 30 years since the Conference of Rio of 1992, and it is now clear that targets for GHG emissions reduction are increasingly harder to achieve, and the aim of keeping the rise of global temperatures under the 1.5°C threshold is a more than ever hard task to reach. According to the UNFCCC secretariat, "We're running out of time but not out of options to address climate change". Actions toward effectively tackling climate change issues must be undertaken in all sectors. This includes the relatively understudied, when related to climate change issues, military and defense sectors: while their contributions to climate change may seem little or rather unimpactful, these sectors are huge energy and therefore fossil fuels consumers, to say the least. These facts alone allow for further research and new insights from various perspectives in this area, which has been called "green defense". This thesis will try to answer how is it possible that, despite the large number of agreements on climate change issues that were adopted in the last thirty years, the defense and military sectors are still exempted from reporting their emissions, and how the U.S., as the world's aspiring leader in tackling climate change, Japan as an Annex I Party, and South Korea as a Non-Annex I Party, are acting towards these particular sets of reporting issues. By following an eclectic approach, the global climate governance system will be analyzed in its science-policy interface, and the issue of the "military emissions gap" will be tackled by looking deep into the relationship between the "policy" and "science" spheres of the UNFCCC. Further areas of research shown by the limits of this work and potential diverse approaches as these institutions develop over time will also be presented to open the research agenda even more.

Thesis Summary in Italian

Questa tesi ha come argomento quello del "*Military Emissions Gap*", un concetto di recente nascita che indica una situazione delle mancate dichiarazioni, all'interno di documenti come gli Inventari Nazionali delle Emissioni in Atmosfera, delle emissioni di gas serra o inquinanti da parte dei settori militari. La questione è stata portata alla superficie da parte di gruppi accademici, di società civile, e ultimamente è stata anche finalmente riconosciuta dalle Nazioni Unite con il loro programma dedicato alle questioni ambientali: l'UNEP (*United Nations Environmental Program*).

Di per cui, le domande di ricerca di questa tesi sono:

(i) Come si è arrivati, nonostante i numerosi trattati, accordi, e iniziative che si inseriscono nello sforzo collettivo contro la crisi climatica degli ultimi trent'anni, ad una situazione dove i settori militari sono in qualche modo esenti dal dover riportare le emissioni causate dalle loro attività?

(ii) Come stanno agendo nei confronti di questa situazione gli Stati Uniti, in quanto aspiranti leader nella lotta alla crisi climatica, il Giappone, in quanto principale paese asiatico facente parte della categoria "Annex I", e la Corea del Sud, come principale alleato di entrambi e "Non-Annex I"?

La tesi, quindi, dopo aver presentato uno Stato dell'Arte che prende in considerazione sia testi accademici che di letteratura grigia, prenderà in analisi le due sfere che compongono il grande quadro del sistema di governance globale dei cambiamenti climatici: quella politica, e quella scientifica, e descriverà come la loro interazione negli anni, e in particolar modo sulle questioni militari, ha portato alla generazione di un ciclo di feedback negativo che ha avuto come principale conseguenza la creazione del "Military Emissions Gap".

Per affrontare al meglio questo discorso e tentare di rispondere alle domande di ricerca, ho scelto di adottare un quadro teorico ibrido, così da poter selezionare le metodologie più adatte per affrontare ogni argomento. La flessibilità teorica è anche utile in quanto permette di aggirare i limiti di una teoria per approcciarne una complementare e restituire un'analisi più multidimensionale e completa. Per la sfera politica, verrà utilizzata la teoria dell'Istituzionalismo Storico e i concetti di "Dipendenza dal Sentiero" (*Path Dependency*) e di "Congiuntura Critica" (*Critical Juncture*) (Capoccia e Kelement, 2007; Mahoney, 2000), uniti alle teorie costruttiviste su "Norme", "Diffusione" e "Identità" (Finnemore e Sikkink, 1998), e infine ad elementi minori di Analisi del Discorso. Per la sfera scientifica, verrà condotta

un'analisi strutturale del Gruppo Intergovernativo sul Cambiamento Climatico (IPCC) e in particolare del suo sottogruppo incaricato di sviluppare le linee guida e le metodologie per compilare gli Inventari Nazionali. Nozioni di natura costruttivista sull'Identità nel rapporto tra scienza e politica, e elementi di Analisi del Discorso completano il sottoquadro teorico. Il tutto verrà armonizzato nella teoria delle "Comunità Epistemiche" di Haas, che servirà da cornice teorica e inquadrerà la questione nel più ampio campo del Nexus tra Scienza e Politica.

Il Capitolo 3 è dedicato, quindi, agli sviluppi politici e diplomatici che si sono verificati dall'adozione della Convenzione Quadro delle Nazioni Unite sui Cambiamenti Climatici (UNFCCC). In particolare, vengono identificate tre "Congiunture Critiche" che hanno portato ad una situazione di "Dipendenza del Sentiero": colloco la prima proprio all'adozione della Convenzione, e in particolare sull'adozione del principio di Responsabilità Comuni ma Differenziate (*Common But Differentiated Responsibilities CBDR)*: difatti, questo principio filosofico (e non legale), ha differenziato i Paesi membri della Convenzione in due categorie, basandosi unicamente su indici socio-economici: gli "Annex I", con a carico più responsabilità e obbligazioni, e i "Non-Annex I", a cui venne permessa maggiore flessibilità sotto ogni ambito della Convenzione. Questa differenziazione ha caratterizzato tutte le conferenze sul clima (*COP*) a seguire ed è risultata, a posteriori, un ostacolo all'azione climatica. Inoltre, essendo la norma non stata recepita in pieno e interiorizzata dai Membri, la sua applicazione si è unicamente fermata a livello internazionale, mentre a livello domestico l'assegnazione della responsabilità per le emissioni è stata sempre gestita liberamente, andando a vantaggio di grandi consumatori di combustibili fossili, tra cui i settori militari. La seconda Congiuntura Critica è stata identificata nell'adozione del Protocollo di Kyoto, uno strumento legale prescrittivo che aveva l'obiettivo di limitare le emissioni dei paesi Annex I. Durante le negoziazioni di questo strumento legale, il Dipartimento della Difesa statunitense esercitò forte pressioni per l'inserimento di una clausola per la sicurezza nazionale, ottenendo l'esclusione da parte delle limitazioni di emissioni derivate dall'utilizzo di combustibili in contesti "internazionali" (*International Bunker Fuels IBFs)*, e rendendo la gestione delle emissioni militari domestiche libera da qualsiasi obbligazione. La terza Congiuntura Critica è identificata con l'adozione degli Accordi di Parigi, che hanno riformato la governance climatica globale in ottica decentralizzata, rendendo "volontari" gli impegni climatici, e mettendo sullo stesso livello tutti i membri per quanto riguarda l'utilizzo di metodologie di report e verifica. Nonostante il periodo ideale per adottare riforme, le discussioni sulle emissioni militari e in particolare sugli *IBFs* non hanno portato a decisioni rivoluzionarie a riguardo: di fatto, le dichiarazioni di emissioni militari

domestiche son state estese a tutti i membri, ma rimangono volontarie e sottostanti a clausole di confidenzialità, mentre non si è raggiunto alcun accordo riguardo la gestione degli *IBFs*.

Il capitolo 4 riporta le varie linee guida adottate durante le conferenze climatiche che indirizzano i membri della Convenzione nella compilazione dei documenti necessari a tener traccia del progresso verso il raggiungimento degli obiettivi climatici, mostrando come negli anni il linguaggio e le decisioni prese riguardo le emissioni militari di qualsiasi tipo sono rimaste (i) inalterate, oppure (ii) non presenti, andando a riprodurre uno stato delle cose sostanzialmente identico dall'adozione del Protocollo di Kyoto in poi, confermando la Dipendenza dal Sentiero.

Il capitolo 5 è dedicato all'analisi della sfera "scientifica" del sistema di governance climatica globale. Viene spiegata la struttura dell'IPCC e dei suoi sottogruppi, identificando come la comunità scientifica sia in realtà molto più coinvolta nella sfera politica di quanto si possa pensare, anche a causa del controllo governativo cui è soggetta l'organizzazione internazionale. In particolare, la nozione di "Comunità Epistemica" caratterizzata da un flusso unidirezionale delle informazioni (la "scienza" che informa la "politica" prima che prenda decisioni) viene criticata, dimostrando come negli anni il ruolo dell'IPCC si sia sempre più spostato verso una posizione ibrida e come si è portata ad operare al confine tra la comunità scientifica e quella politico/diplomatica, risultando sempre più una "Organizzazione di Confine" (*Boundary Organization*). Anche i suoi processi decisionali, una volta analizzati nella struttura, risultano perciò molto meno lineari del previsto, arrivando nelle fasi finali ad assomigliare a delle e vere negoziazioni tra scienziati e politici/diplomatici. Il capitolo poi si spinge ad approfondire il ruolo del sottogruppo dedicato allo sviluppo e pubblicazione delle Linee Guida dell'IPCC per gli Inventari Nazionali delle Emissioni in Atmosfera, le quali comprendono sia metodologie consigliate che vere e proprio guide alla compilazione di questi. Anche qua, il controllo governativo è presente e opera vere e proprie pressioni sugli autori, come riportato da Yona et al., che durante le loro interviste hanno dimostrato come spesso i contenuti di queste metodologie son selezionati e scritti anche tenendo conto della probabilità che non vengano contestati da parte dei Governi membri dell'IPCC, risultando così meno complete e ambiziose rispetto a quanto sarebbe necessario nell'ottica del contrasto alla crisi climatica. In particolare, il capitolo si concentra poi sull'analisi delle pubblicazioni delle metodologie da parte dell'IPCC nelle sue versioni del 1996, 2000, 2006 e 2019, andando a cercare articoli specifici per quanto riguarda le emissioni militari: dall'analisi risulta che queste vennero inizialmente ignorate, nelle Linee Guida del 1996; dalla pubblicazione delle "*Best Practices*" del 2000 e procedendo nelle

Linee Guida del 2006, esistono specifiche sezioni progressivamente più dettagliate che trattano le emissioni militari, ma senza contenere metodologie specifiche, o provvedendo dati e linee guida spesso datate, basate su tecnologie nel tempo superate, o semplicemente trasportate dal settore civile a quello militare, pur riconoscendo le notevoli differenze tra i due. Spesso l'IPCC ritiene necessario l'inserimento di queste emissioni nelle dichiarazioni degli Stati, ma allo stesso tempo contempla l'utilizzo di clausole di sicurezza nazionale o di confidenzialità per proteggere dati sensibili, replicando in linguaggio e forma le stesse clausole e articoli presenti nei documenti adottati durante le varie Conferenze Climatiche. Nonostante ciò, sono presenti dei codici specifici per riportare le emissioni da parte dei settori militari, anche se il loro utilizzo è soggetto ad una libera gestione degli Inventari e della loro composizione da parte dei Governi Membri. Questi codici, che si riferiscono alle tabelle che vengono compilate negli Inventari delle Emissioni, sono presentati e discussi nei paragrafi finali del capitolo prima di passare all'analisi dei casi di studio.

Il capitolo 6 presenta i casi di studio di Giappone e Repubblica di Corea, dimostrando come in entrambi i casi le dichiarazioni di emissioni militari risultino mancanti (sia Giappone che Corea del Sud), o comunque caratterizzate da una mancanza di trasparenza (come nel caso del Giappone, che aggrega parte di queste ad altre categorie per poi indicare quelle militari come "*Not Occurring*"), o incomplete. Inoltre, anche nelle varie spiegazioni ed illustrazioni dei processi di compilazione degli Inventari Nazionali e nello stilare le politiche climatiche poi presentate ai sistemi di report e revisione della Convenzione Quadro. Il capitolo si chiude presentando anche un effettivo Inventario Nazionale da parte della Repubblica di Corea utilizzando le Linee Guida del 2006 (più aggiornate) e presentando una stima di emissioni militari provenienti da sorgenti stazionarie: tale documento, tuttavia, rimane puramente di uso domestico. Il capitolo, quindi, conferma l'esistenza del "*Military Emissions Gap*" attraverso l'analisi di fonti primarie da parte di Giappone e Corea del Sud.

Le conclusioni presentano un riassunto della tesi, confermano l'esistenza del ciclo di feedback negativo, e chiamano la comunità accademica a ricercare questo argomento, anche includendo questioni come il ruolo della società civile, o il ruolo del complesso militare industriale.

La tesi presenta anche un Appendice, dove vengono presentati gli sviluppi più recenti e prospettive future sull'argomento, in particolare analizzando la sessione dedicata alla "*Climate Security*" del *Leaders' Summit on Climate* del 2021, e prendendo in considerazione le conseguenti pubblicazioni di Strategie Climatiche da parte dei settori della Difesa di vari paesi, incluso il Giappone.

I – Introduction, Research Questions, and State of the art

1.1 – Introduction and Research Questions

Climate Change is the single most perilous issue of collective responsibility that humans have ever faced. This situation is reflected and thoroughly analyzed in the latest Assessment Report produced by the Intergovernmental Panel on Climate Change and published between 2021 and 2023, which is articulated in three volumes: *"Climate Change 2021: The Physical Science Basis, "Climate Change 2022: Impacts, Adaptation and Vulnerability"*, "*Climate Change 2022: Mitigation of Climate Change"*, and finally the Synthesis Report (SYR) of these three in 2023. This last volume also serves as the Summary for Policymakers (SP) and is a brief compilation of the contents presented by the three Working Groups dedicated to the writing of the more comprehensive thematic volumes. According to the AR6 SYR SP, "human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming", inducing "widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere" that led to "adverse impacts and related losses and damages to nature and people". (IPCC, 2023)

After the latest State of the Global Climate Report (GCR) in 2024, the secretary-general of the United Nations, António Guterres, has stated that "Earth is issuing a distress call. The latest State of the GCR shows a planet on the brink", calling global leaders to promptly and effectively act as "there is still time to throw out a lifeline to people and planet". (UN Press, 2024)

At the latest Conference of Party (COP) of the United Nations Framework Convention on Climate Change (UNFCCC), the chair and president of the host country, the United Arab Emirates, declared that "every nation, every sector, and every one of U.S. has an urgent role to play", and in the occasion of the first collective global assessment on the progress made towards the UNFCCC objectives, he also added that "we must ensure that this COP delivers the most ambitious Global Stocktake possible". (COP 28, 2023)

Despite these declarations from numerous policymakers and representatives, scientists warned that it is likely that global temperatures will "exceed 1.5°C during the 21st century and make it harder to limit warming below 2°C", as the 2030-targeted policies implemented by Parties would result in "gaps" between projected emissions and the required levels of effort "needed to meet climate goals across all sectors and regions". As current climate policies are insufficient, "continued greenhouse gas emissions will lead to increasing global warming", with every increment being exponentially dangerous to the Earth System. Again, the IPCC deems it necessary to reach "net zero CO2 emissions" to limit anthropogenic global warming, and specifically recommends a "climate-resilient development [that] integrates adaptation and

mitigation to advance sustainable development for all, and is enabled by increasing international cooperation", finally concluding that "the choices and actions implemented in this decade will have impacts now and for thousands of years". (IPCC, 2023)

In turn, the UNFCCC Secretary-general, Simon Stiell, declared that "the climate crisis is hitting every country and every economy; no country alone can fix it, [but] climate action is a chance to unite around a common cause: survival, justice, prosperity. In short - Divisions will destroy us. But solutions can save us" (UNFCCC, 2023).

Hence, after more than 30 years since the Conference of Rio of 1992, it is now clear that targets on GHG emissions reduction are increasingly harder to achieve, and the aim of keeping the rise of global temperatures under the 1.5°C threshold is a more than ever hard task to reach. On the day of publication of the AR6 SYR SP, Stiell added: "we're running out of time but not out of options to address climate change" (UNFCCC, 2023). Actions toward effectively tackling climate change issues must be undertaken in all sectors. This includes the relatively understudied, when related to climate change issues, military and defense industries: while their contributions to climate change may seem little or rather unimpactful, these sectors are huge energy and therefore fossil fuels consumers, to say the least. These facts alone allow for further research and new insights from various perspectives in this area, which has been called "green defense"[1].

This thesis is then inserted in the relatively new and niche research field that discusses the "military emissions gap". This concept reflects the current state of military emissions reporting: even though militaries are huge fossil fuel consumers, and therefore huge GHG emitters, reporting requirements of their emissions have been historically exempt until the Paris Agreement, which made them voluntary; hence, "data is often absent or incomplete – this is the military emissions gap". According to the Military Emissions Gap organization, which also coined the term:

> The military emissions gap has three components. The first is what governments are obliged to report to the United Nations Framework Convention on Climate Change (UNFCCC). The second is how they report their military emissions. The third is what they don't report." (Military Emissions Gap, 2021)

[1]The term has been used so far by governmental and intergovernmental institutions such as the Italian Ministry of Defense and NATO. Synonyms or periphrasis indicating the same concept are also used by more institutions.

The issue has been noticed and researched by scholars from different backgrounds and fields, (Michaelowa and Koch, 2001; Gould, 2007; Jorgenson et al., 2010, 2023; Belcher et al., 2019; Crawford, 2019, 2022; Lawford-Smith and Eriksson, 2020; Sparrevik and Utstøl, 2020; Rajaeifar et al., 2022; Depledge 2023) as well as organizations of various type such as the Conflict and Environment Observatory (CEOBS), the Tipping Point North and South, the International Military Council on Climate and Security, the Scientists for Global Responsibility (SGR), and has also drawn the interest of institutions such as the Organization for Security and Co-operation in Europe (OSCE) and the European Union, but has apparently received little to no attention from policy-makers during COPs climate negotiations, as well as from scientists working in the IPCC for the compilation of crucial publications such as the Assessment Reports or the guidelines and methodologies for reporting GHGs.

This issue has finally gained official recognition from the United Nations Environment Program (UNEP) in the latest UNEP Reporting Emissions Gap (EGR). This annual report is published right before the UNFCCC Conference of Parties. It serves as an official tracker of the gaps between "where global emissions are heading with current country commitments and where they ought to be to limit warming to 1.5°C" (UNEP, 2023). The report states, in about a paragraph out of more than a hundred pages, that:

> Direct emissions from military operations, vehicles and installations are likely nontrivial, but remain insufficiently accounted under UNFCCC reporting conventions, and there is limited evidence in the literature on the scope, scale, composition or trend of these emissions. (UNEP, 2023)

Therefore, the research questions that drive this thesis and its arguments and implications are the following:

(i) How is it possible that, despite the large number of agreements on climate change issues that were adopted in the last thirty years, the defense and military sectors are still somewhat exempt from reporting their emissions?

(ii) How is the U.S., as the world's aspiring leader in tackling climate change, Japan as an Annex I Party, and South Korea as a Non-Annex I Party, acting towards these particular sets of reporting issues?

This thesis will contribute to the ongoing formation and definition of the research field that revolves around the issue of the "military emissions gap" by including an analysis of both the "policy" and "science" interfaces of the UNFCCC. To harmonize and link the two, I opted for

the adoption of a hybrid theoretical framework that combines different methodologies and theories to ultimately try to answer the proposed research questions and shed light on what the relationship between the two meant for the "military emissions gap". Primary source materials will include official negotiations documents, as well as minutes and recordings of official meetings, publications by various institutions, and reports compiled by the governments of the selected countries mentioned before; existing academic literature will integrate and complement the analysis, including monographs and peer-reviewed journal articles; grey literature, such as reports from non-academic institutions, and some newspaper articles will also be utilized when deemed necessary; finally, secondary data will be retrieved, analyzed, and processed from either official governmental organization or well-known and trusted institutions.

To better introduce the reader and delimit the field of research of this thesis, the next chapter will provide a review of the State of the Art on the issue of the "military emissions gap", or closely related topics, as well as a brief presentation of academic works that more generally tackled the relationship between science and policy.

1.2 – State-of-The-Art Review

This chapter will provide a review of the publications that are related to the topic of this thesis: as the issue of the military emissions gap is fairly recent, a proper academic line of research has not been completely formed yet: even in robust and thorough articles reviewing the academic literature on the broader topic of the relationship between militaries and the environment, that of military emissions is deemed as a "central but poorly documented" aspect of the nexus. (Vogler 2024)

Hence, this section will be treated more as a review of the State of the Art on the "military emissions gap", since both academic and grey literature will be included. The first part will cover the literature on the "Policy" sphere and will follow a chronological order to show the birth and current evolution of this mostly recent research area. The second half will be dedicated to issues related to the "Science" pole divided into thematic areas: from the broader topic of the Science-Policy nexus to more specific articles and publications on the role of the IPCC and its sub-units.

It is nonetheless noteworthy that, especially in the first half, the interdisciplinarity of some articles makes it natural that some themes that might pertain to the "Science" sphere would also be treated in policy discussions, as well as the reciprocal. This highlights that the communication and cooperation between the two academic communities is open rather than sealed or unidirectional.

A first glimpse of academic literature on the issue of military emissions can be traced to Axel Michaelowa and Tobias Koch's publication of 2001 "*Military Emissions, Armed Conflicts, Border Changes and the Kyoto Protocol*", where they addressed and analyzed the impact of military activities in four different contexts under the legal framework of the Kyoto Protocol. The objective of this groundbreaking paper was that of assigning responsibility in the four proposed scenarios of (i) peacetime military emissions; (ii) emissions derived from military operations; (iii) change of emissions allocations due to changing borders and disputes; (iv) emissions related to refugee movements. After the main analysis, the authors conclude that military emissions "will become an important issue in the design of national climate policy, especially if bunker fuels will be included in national totals", optimistically concluding that "modern equipment has a tendency to become less energy-intensive" and suggesting to adopt rules for the allocation of GHG emissions related to conflicts, territorial changes, market distortions in emissions trading, aspiring to a "strengthened Kyoto Protocol [that] could be

instrumental in reducing the growth of international conflict potential due to climate change". (Michaelowa and Koch 2001)

Kenneth Gould linked militarization to the treadmill of destruction theory, deeming it "the single most ecologically destructive human endeavor" due to their requirement of "enormous levels of surplus economic production for diversion to destructive ends". Moreover, Gould also links its argument to legal issues, highlighting the relationship between military production and its exemption from environmental legislation due to national security clauses. (Gould 2007)

Jorgenson, Clark, and Kentor discussed the relationship between military organizations, their GHG emissions, and specifically climatic topics. Building on the treadmill of destruction and environmental degradation theory proposed by Gould, the team conducted an empirical study to validate it: the authors considered the military participation rate and military expenditure per soldier aspects and compiled a panel analysis including various countries where data is publicly available and feasible. The results of the study confirm that "both the number of soldiers and technological sophistication of militaries have significant impacts on the environment", including the crucial aspect of carbon emissions. Finally, Jorgenson et al. concluded that "While it is well understood that military institutions focus on protecting their respective nation-states and not the environment, […] [their structures are] highly resource consumptive [and thus] exacerbate ecological problems at multiple scales". (Jorgenson et al., 2010)

More recently, Belcher, Bigger, Neimark, and Kennelly analyzed the global logistical supply chain of the U.S. military, and highlighting how the U.S. Defense Logistics Agency – Energy (DLA-E) is responsible for the massive amount of resources supplied to the Pentagon to keep it running smoothly, as well as how the U.S. Military is trying to convey its public image towards an "ecologically friendly" actor. Their analysis stresses the "imperialist" role of the DLA-E in providing increasing resources to the U.S. DOD (including fossil fuels); the data retrievable from the work of the DLA-E then is used to expose the huge fossil fuel consumption of the U.S. Military. The authors then provide the numbers of the U.S. Military emissions, highlighting how these are exempted from reporting under the Kyoto Protocol, and how the U.S. would not count them in the Paris Agreement since at the time of publication, former U.S. President Donald Trump had already withdrawn from the treaty. While the goal of the paper was to give "the first picture of the international organization of global supply chain that makes the everywhere war possible", its focus was brought upon the carbon boot-print of the U.S. military that has been kept "hidden" over the years. The authors finally call for a much more radical and effective decarbonization effort that drives away from the "drop-in" strategy of

simply replacing fossil fuels (ie. with biofuels) while maintaining the whole military structure unmodified. (Belcher et al. 2019)

The same year, Neta C. Crawford published an article where she questioned the relationship between climate change, national security claims from the U.S., and the contribution of the Pentagon to global GHG emissions. The paper utilizes available data on energy consumption, purchase, distribution, and reporting to (i) describe the "scale and pattern of U.S. military fuel use"; (ii) estimate the U.S. military's GHG emissions from 2001 to 2018, as well as long term trends from 1975-2018; (iii) include national security and climate change concerns organically into an assessment on how the U.S. government and the DOD adopt climate policies. The final goal of this paper was to show how reducing dependency on fossil fuels would bring a series of benefits to some critical issues that the Pentagon historically deals with, such as oil supply access. Climate-friendly decisions would also bring benefits to overall U.S. GHG Emissions, and in turn, climate-change-related risks that might impact national security. Crawford, moreover, highlighted a gap in military emissions reporting and insisted on how omissions, imprecise calculations, and a general lack of transparency in military emissions reporting are critical features of the report and verification systems of the United Nations Framework Convention on Climate Change. Crawford also suggests the adoption of a "Comprehensive reporting [system] of DOD fuel consumption and energy usage". (Crawford 2019)

The Tipping Point North and South organization published a report titled "*INDEFENSIBLE: The true cost of the global military to our climate and human security. The case for deep cuts to global military spending and emissions*", tackling for the first time the issue of military emissions at a global level and stressing on the major accounting and reporting problem. For the first time in the literature on the "military emissions gap", the paper reports on the role of the Intergovernmental Panel on Climate Change as a relevant actor in the general picture, given its role of providing methodologies for GHG Reporting. The report then proceeds to mention how the current global climate governance system under the UNFCCC presents exemptions for international military emissions and leaves domestic ones' reporting and management to the will of national governments. One section is dedicated to the difficulties of estimating GHG Emissions by militaries globally due to a lack of reliable data. In the end, the global military and its military-industrial complex are deemed "a significant and wholly unaccountable driver of climate breakdown". The report finally calls for COP to require "*compulsory* full GHG emissions reporting to UNFCCC" and the inclusion of militaries and related industries in the

GHG emission reduction targets of Nationally Determined Contributions under the Paris Agreement. (Tipping Point North and South 2019)

Sparrevik and Utstøl first tried to assess and estimate the emissions of the Norwegian defense sector in a comprehensive way. The authors utilized the Organizational Life Cycle Assessment (O-LCA) method to "compile and evaluate the inputs, outputs and potential environmental impacts of the activities associated with an organization and the provision of its product portfolio". The authors utilized data from the Norwegian Ministry of Defense, the Defense Estates Agency, the Norwegian Defense Research Establishment, and finally the Defense Material Agency. The sources of the GHG emissions were determined based on the IPCC Guidelines for National Greenhouse Gas Inventories. The results of the study compose an assessment of the life cycle greenhouse gas emissions of the Norwegian defense sector divided by three types of activities: (i) military assets and systems, (ii) operational assets, and (iii) building assets, including already reported data by the organizations related to the defense sector, and estimations of both upstream and downstream emissions. The study deems the O-LCA method as a viable tool to estimate emissions from complex and large organizations such as those related to defense. (Sparrevik and Utstøl, 2020)

Issues of collective responsibilities and the role of the institutional sub-agencies and organizations that compose a nation-state are tackled by Lawford-Smith and Eriksson in "*Are States Responsible for Climate Change in Their Own Right?*", where the authors directly indicate militaries as an important branch of any government that should be included in reporting and accounting of emissions: the case of the Australian Defense Forces is then presented and shown how "it is the largest government emitter" and concludes that "in thinking about the Australian State as a culpable emitter, the military [alone] would give us a solid foundation for thinking that it is". (Lawford-Smith and Eriksson, 2020)

Linsey Cottrell wrote an article on the Conflict and Environment Observatory's organization blog on the hypothetical scale of emissions related to military activities. The author observes that most military emissions are not reported to the UNFCCC, and most of these emissions are related to the supply chain and other sensitive and highly uncertain areas such as international bunker fuels, military estates and training fields, and the management of waste. Cottrell also takes into consideration the contribution of industries that manufacture and sell weapons, as well as how much they report estimates of their emissions under Corporate Social Responsibility (CSR) regulations. The author concludes that accounting and reporting of

military emissions are often “incomplete” and calls for greater transparency and “more robust reporting so that emissions can be managed and reduced”. (Cottrell 2021)

The year 2022 recorded a steep increase in attention and articles of different types that shed light on the issue of military emissions: first and foremost, the National Security Archive (NSA) group requested access of then classified documents on the Kyoto Protocol negotiations. Via the Freedom of Information Act (FOIA), the investigative group made accessible a series of reports, official documents, negotiation records and so on that proved the interference of the U.S. Department of Defense in climate negotiations during Kyoto and published them on their website for public use. (National Security Archive 2022)

The International Military Council on Climate and Security published a report where they dedicated the full first chapter to the issue of a missing specific methodology for tracking and counting military emissions. The main obstacles to the development of a shared and common method of calculation are, according to the author Pierre Laboué, (i) the sensitive nature of the raw data needed to estimate emissions, (ii) the consequences that reporting emissions could lead to (esp. quantified limitations), (iii) the harmonization of the differences between armies in terms of composition, scale, equipment, and type of operations conducted. To partially solve this, the author proposes to develop a common methodology for emissions related to energy consumption (Scope 1 and 2) and an ad-hoc methodology for emissions linked to the supply chain (scope 3). Laboué also identifies the institutional constraints that make the development of a methodology for military emissions hard to achieve: the structure of the reporting system of the UNFCCC is regarded as “full of loopholes”, incomplete, and “not particularly useful”, identifying in the Kyoto Protocol the historical origin of this gap. (IMCCS 2022)

The Tipping Point North and South organization and Perspective Climate Group also published another report authored by Michaelowa, Koch, et al. The report’s structure is similar to the 2001 Michaelowa and Koch article, and the authors describe “principles for accounting for military emissions in peace and war and related liabilities”. The authors also acknowledge a “reporting gap in international climate policy” that originated in the Kyoto Protocol, but also identified the protraction of this gap within the new Enhanced Transparency Framework of the Paris Agreement, where “the decision to allow countries to protect confidential business and military information essentially perpetuates the opaqueness regarding military emissions”. The authors then list the different types of military emissions and provide their proposed principles for accounting in the cases of (i) emissions in their territory, (ii) emissions in foreign territory at peacetime, and (iii) emissions during armed conflicts; this last topic is also faced with many

case studies illustrating the possible types of conflicts. While the report heavily focuses on the cases of conflict-related emissions, some of the proposed solutions to fill the gap of military emissions rely upon the strengthening of the Paris Agreement, as well as pushing civil society to demand more transparent reporting during such occasions as the Global Stocktake. (Michaelowa et al. 2022)

The OSCE also published a report with the cooperation of the Friedrich-Ebert-Stiftung Regional Office for International Cooperation, where the authors Evergreen, Lorca Arce, and Simić reported that "information on the military sector's role in the climate crisis is scarce" and that "without greater transparency, governments and militaries cannot be held accountable". The authors deem the development of standardized military emissions reporting as a "key starting point" and propose three cases where these would benefit the global effort towards tackling climate change: (i) military activities during peacetime, (ii) military activities during wartime, and (iii) military activities/consequences after a war. Finally, the authors ask OSCE to "act as a facilitator […] to promote action [and] […] strengthen dialogue and expert involvement needed to detail exactly how reporting standardization should work". (OSCE 2022)

Doug Weir of CEOBS also calls on the intervention of the IPCC to discuss and eventually develop "comprehensive reporting standards" that would "radically increase confidence in global military emissions mitigation efforts". (Weir 2022)

Linsay Cottrell and the CEOBS team published the report "*A Framework for military Greenhouse Gas emissions reporting*", independently trying to cover the methodology gap that exists regarding military emissions. The reasons for the development of this independent framework rely upon the historical exemption of militaries and the consequences of the new report system under the Paris Agreement that is based upon the will of the Parties. The stated goal of the report is to "set out an initial framework for the military sources that emissions reporting should cover". Cottrell then identifies a Scope 1, Scope 2, Scope 3, and Scope 3+ categories for military emissions that should cover direct, indirect, and other types of sources of emissions all related to military activities. (CEOBS 2022)

Neta C. Crawford concluded and published a comprehensive study on the relationship between the U.S. military, Climate Change and Conflicts with her groundbreaking monography: "*The Pentagon, Climate Change, and War. Charting the Rise and Fall of U.S. Military Emissions*". The book is divided into four sections, each covering a particular aspect of the topic Crawford decided to illustrate in the introductive section, Crawford thoroughly

describes what the “military emissions gap” is, and proceeds with an explanation of Scope 1, 2, and 3 emissions, clarifying that a reporting issue does exist within militaries and that the origins of this are traced back in the Kyoto Protocol and subsequent climate decisions and treaties; the author also explain how it is important that political scientists begin to understand GHG emissions and the related reporting systems. The book aims to describe the “deep cycle” of economic growth, fossil fuel use, and their dependency that impacted how the U.S. Military behaved in its decision-making processes, but also how climate change threats are now changing the stances of the Pentagon while it tries to maintain its role and power untouched. The first part of the book focuses on reconstructing the historical role of the Pentagon in utilizing fossil fuels, and the codependent relationship that has existed between the Department of Defense (DOD), fossil fuels, foreign policy, and conflicts. In the second part of the book the role of science is inserted in the equation, and Crawford exposes the Pentagon in how it started studying the effects of GHG emissions since the 1950s, and how it interfered during climate negotiations (esp. the Kyoto Protocol negotiations) to keep military emissions off the radar. Crawford then proceeds to estimate GHG emissions from the Pentagon since 1975 utilizing publicly available data such as those provided by the U.S. Department of Energy (DOE), and recent reports directly from the Defense Logistics Agency (DLA), the DOD itself, and some of the major corporations of the military-industrial complex. The third part of the book discusses how Climate Change has started to be included in the U.S. military doctrine and national security strategies due to its “threats multiplier” nature, and how energy security for the Pentagon is impacted and has natural consequences on human security as well. The climate and security nexus., in the optics of the Department of Defense officials and under the presidency of Bush Jr., Obama, Trump, and Biden is also analyzed in its implications and development over the years presented and discussed. Finally, prospects are also inserted in the analysis that Crawford conducts: mitigation and adaptation options to “greening” the army are then presented and debated in their potential efficiency, for example, the introduction of biofuels, or the conversion of military bases to greener options in both construction and the supply of energy. In conclusion, the author provides harmonization of all the concepts she explained in the book with the notion of “climate security”, providing a final theorization and conceptualization of the “deep cycle” that affects the U.S. Military: the proposed solution to “break the cycle” is that of decreasing dependence on fossil fuel procurement and use, in turn allowing the evolution of the national security doctrine away from the pivotal role that oil has continuously played in the development of the U.S. Military frame of mind. The author also includes some economic analysis of reducing dependence on fossil fuels in terms of reduced budget allocated to the

Pentagon, in turn allowing for more investments towards fighting the climate crisis and sparking "enormous positive implications for the global climate and the U.S. economy, creating a positive feedback loop as powerful as the "deep cycle" that has amplified global military and military-industrial emissions". (Crawford 2022)

The SGR and CEOBS teams co-authored the report "*Estimating the Military's Global Greenhouse Gas Emissions"*, authored by Stuart Parkinson and Linsey Cottrell. The study reaffirms the importance of estimating military emissions as they present huge gaps in both reporting obligations under the UNFCCC and lack discussion within the IPCC as well. The authors utilized an "emissions per head of personnel" methodology based on the number of active service members in the national armies of various countries. Parkinson and Cottrell conducted a computation of emissions estimations using four datasets and variables: (i) stationary emissions for active personnel for military bases; (ii) number of active military personnel; (iii) ratio of operational GHG emissions between mobile military activities; (iv) a supply-chain multiplier developed from a lifecycle GHG emissions analysis. Their final estimations ranged from a minimum of 1.0% to a maximum of 5.5% of total global GHG emissions that would derive from militaries in the years *before* 2020. (Parkinson and Cottrell, 2022)

The issue of the military emissions gap also reached the journal Nature, where Rajaelfar, Belcher, et al. (a group of scholars composed of natural and social scientists) wrote "*Decarbonize the military – mandate emissions reporting*", a call for increased attention on the issue of missing accounting requirements for global militaries. The authors state that the reasons for this gap rely on both politics (the UNFCCC) and a lack of expertise in the IPCC. The group calls for researchers to develop specific and "accurate methodologies for calculating emissions from military activities […] [and] identify data gaps". They also present areas where research investment is needed such as (i) "methods for independently verifying military-emissions accounting by third parties without compromising national security", (ii) studies on "breaking down emissions by technology sectors", and finally (iii) "studies on the feasibility of adopting low-carbon technologies". As for future steps in closing the gap, the authors call for increased action in four areas:

- A strengthening of the UNFCCC by specifically including military emissions reporting in its Protocols
- Improvement from militaries in their capacity to "calculate, manage and reduce emissions, and train personnel to do so" by also including researchers in this effort

- More research on the impacts of conflicts on climate and society
- More support to independent researchers to research the development of “commonly understood and verifiable means of emissions accounting” (Rajaelfar et al. 2022)

The Green Korea United organization released a report about the Republic of Korea’s national army and its GHG emissions reporting. The group analyzes the reports of the Republic of Korea’s Ministry of National Defense on the emissions produced by its military. According to the study, the estimated emissions from the ROK’s military emissions are “higher than the total emissions of the public sector”, but also are not subject to management and reductions, as the “Public Sector GHG Energy Target Management System' does not include the military sector”. The report also denounces the inactivity of the military in developing and adopting effective climate policies, and the general loophole of the current global climate governance system regarding military emissions. (Green Korea United, 2022)

In 2023, Duncan Depledge traced back the history of the “climate security” dilemma, and presents the issues of “whether militaries can afford to be left behind if the rest of the world continues to decarbonize”, identifying an “economic/technological” and a “societal/political” problem: according to Depledge, current armies still heavily rely on fossil-fueled technologies and will become increasingly costly in the future as the world likely approaches net-zero; this evolution, however, will also bring new challenges for the armies and their perceived role in society, both for peacetime and wartime, as “societal changes influence how militaries organize, equip, train, fight and ultimately go to war”. This process is occurring in the West at a more rapid pace than the rest of the world, with the case of the U.S. as an example: in fact, the article states that the DOD decided to subject itself to the federal climate policies adopted under the Biden administration, following the UK Ministry of Defense example. Depledge also cites the military emissions gap as a real issue, adding that “we are nowhere near to addressing the full scope of emissions that result from military operations”. This issue, Depledge concludes, “matters greatly when it comes to determining exactly what is being put on the table when we invoke terms such as *low-carbon* warfare or *green* militaries or *net-zero* defense”. (Depledge, 2023)

Jorgenson et al. recently conducted a study on the impact of militarization on the carbon emissions of nations. The authors link the heavy consumption and production patterns of militaries to the economic growth that follows an increase in those, and consequently to the increasing emissions of GHG that naturally occur with this process: the authors theorize that “the effect of economic growth on emissions is likely greater for nations with larger and more

capital-intensive militaries" and develop a methodological model based upon available data such as CO2 emissions per capita of nations, GDP per capita, military expenditures per soldier, military participation rate, and their interaction. The team then builds five different models with the inclusion of additional independent variables such as weapon developments, arsenals, building of dedicated infrastructures, and so on. The study concludes that "militaries exert a substantial influence on the production and consumption patterns of economies, as well as the environmental demands required to support their evolving infrastructure". (Jorgenson et al., 2023)

Literature on the IPCC and the Science interface of the UNFCCC also met scholars' interest in recent years due to the increasing relevancy of the organization and its uniqueness. This strain of literature is inserted in the academic research area of the relationship between science and policy in the context of Climate Change, represented by works such as Jasanoff's "*The Fifth Branch: Science Advisors as Policymakers*" (1990), Shackley and Wynne's "*Integrating Knowledges for Climate Change: Pyramids, Nets and Uncertainties"* (1995), Miller's "*Hybrid Management: Boundary Organizations, Science Policy, and Environmental Governance in the Climate Regime"* (2001), and more IPCC focused publications such as Shaw and Robinson's "*Relevant but not Prescriptive? Science Policy Models within the IPCC"* (2004).

Recent publications that tackle issues on the Science-Policy nexus. more from a theoretical point of view are those contained in the volume edited by Turnhout, Tuinstra, and Halffman, "*Environmental Expertise. Connecting Science, Policy, and Society*". The book is articulated in eleven chapters, each covering different aspects of the philosophy of science of environmental issues. Of particular interest to this thesis are the notions of framing in chapter three by Willem Halffman, with the linked case study on framing climate change by Mike Hulme. The authors challenge the idea of removing the process of "framing" from natural sciences, where facts are usually opposed to values, and making "scientists "stick to the facts" and avoid getting entangled in politicking" (Halffman 2019). In particular, Hulme's case study research on framing Climate Change debates the IPCC's Framing of Climate Change as "*global, singular,* and *placeless*", leaving aside regional and local knowledge in favor of a global challenge that requires global solutions. Hulme also discusses how the causes of Climate Change are also framed differently, bringing the IPCC's view of "natural" causes related to hard science, while the UNFCCC attributes the origins of this phenomenon to human activities and anthropogenic interference; besides these two main frames of identification of the causes of climate change, Hulme presents more framings such as global injustice, market failures, overconsumption and

so on, concluding that "facts and values combine, through declaration or negotiation, to produce radically different framings […] [to be] aware of […].". The author finally challenges the idea that "science progresses in a linear manner", observing how "the philosophy and practice of climate science keep changing the form and locus [and] […] its key questions, its forms of representation, its use of metaphors, and its public communications". (Hulme, 2019). Chapter nine of the book is dedicated to the Science-Policy-Society Interface. The author Esther Turnhout discusses the role of environmental experts of various types, who link the work of scientists to that of policymakers and the general role of civil society. Experts' roles are identified into three main domains of activities: (i) servicing, which includes some mainstream experts' activities such as doing research and "supply knowledge that may be used in decision-making processes"; (ii) advocating, or the practice from experts to "produce knowledge that fits with their own norms, values and interests", a practice often "associated with the manipulation of scientific knowledge for political purposes" and thus. disregarded within scientists; (iii) diversifying, meaning the consideration of adopting a "different strategy and assuming the role of a broker", which involves "an explicit commitment to diversity and to meeting the needs of different relevant stakeholders […] [with] a broad spectrum of perspectives and values". (Turnhout, 2019)

Kari de Pryck and Mike Hulme edited and published "*A Critical Assessment of the Intergovernmental Panel on Climate Change*". The book contains articles from a wide range of scholars exploring the various issues that characterize the IPCC today: the five sections of this publication cover the wide topics of (I) governance, (II) participation, (III) knowledge, (IV) processes, and (V) influence. In chapter three, Olivier Leclerc describes the procedures of the IPCC and focuses on the maintenance of balance between science and politics. Of particular interest are the explanations on the preparation of IPCC reports, where the author shows how much governments have the power to intervene and potentially interfere. The article also highlights how these procedures do not follow a "linear model of expertise" but rather are organized in an "iterative process linking scientific assessment to political questions and international negotiations on climate change" (Leclerc, 2023). Hannah Hughes' analysis of participating governments in the IPCC demonstrates how the organization has evolved from an "Epistemic community" towards assuming the form of a "Boundary Organization" that "reflects in equal measure the scientization of politics and the politicization of science" (Hughes, 2023). The role of governmental approval is also further discussed in De Pryck's chapter that explores the specific processes of evaluation and final approval from member governments to IPCC draft reports and publications; the study breaks down this process and deems it a

"negotiation" between politics and science, where many back-and-forth situations regularly occur and are resolved through talk sessions between authors and commentators. The article finally highlights, also through the use of interviews, how certain IPCC publications such as the Summaries for Policymakers have become more and more "*by* policymakers rather than […] *for* them" (De Prycke 2023). Finally, Mahony's article on the issue of Policy Relevance and Neutrality by the IPCC also constitutes a relevant academic piece as it tackles one of the founding principles of the IPCC: its neutrality that stirs away from policy prescriptiveness. Mahony utilizes historical examples where this controversial feature of the IPCC has undergone tensions where its neutrality was challenged: this was the case for almost any of the Assessment Reports that have been released over the years, where the "drawing a line between science and policy, relevance and neutrality, is a product of negotiation within particular contexts", deeming it as a "practical, context-bound achievement". (Mahony, 2023).

Pierre-Bruno Ruffini also explored the dimension of the Science-Diplomacy Nexus and the IPCC where he studied the hybridization of science and diplomacy in the international climate regime. Ruffini utilizes evidence from the work and processes of the first Working Group (WG) of the IPCC, which studies the Earth System discipline, and states that "the intricate, often hybrid, process of providing scientific evidence challenges the idea that scientific information would flow fairly smoothly to policymakers, enabling them to make rational decisions". Ruffini also explores the effectiveness of the science-diplomacy nexus, highlighting the imbalance between scientists and diplomats and the difficulties associated with interdisciplinary communication. The article shows how effective and influential scientific knowledge rarely reaches decision-makers, leaving space for interpretations that ultimately "results in collective inaction later on [during negotiations]", and addresses national interest as one of the obstacles that affect the effectiveness of the science-diplomacy nexus. In conclusion, the author demonstrates how the current science-diplomacy nexus. is less effective than it should be for two reasons: (i) scientific knowledge on climate change is "not taken into account sufficiently enough during diplomatic decisions", and (ii) government representatives tend to adopt stances that do not reflect the consensus on climate change's scientific claims; this ultimately results into the failure of the translation of scientific climate knowledge into diplomatic consensus. (Ruffini 2018)

Hernansen et al. analyzed the role of the IPCC and the science-policy nexus. The three authors discuss the relevancy of IPCC reports after the decentralization of the effort towards tackling the climate crisis that occurred after the adoption of the Paris Agreement in 2015. They

pointed out that “there is a lack of dialogue between those who study the IPCC, those who are involved in the IPCC in different capacities, and those who read and rely on the reports”, thus making it difficult to design and “align what is policy-relevant – or desirable”. The authors finally conclude with four proposed reform agendas that would open up the possibility of either maintaining the status quo and continuing the work “business as usual” or evolving the organization by adopting a “one-world-perspective”, orchestrated toward “broad knowledge creation” and “reflexive learning” as ideal outcomes for the IPCC to remain relevant and improve the impact of the crucial work that it carries on. (Hermansen et al., 2023)

Recently a group of scholars researched one of the most understudied bodies that compose the IPCC, but also one of the most important ones: the Task Force on National Greenhouse Gas Inventories (TFI). In “*Factors Influencing the Development and Implementation of National Greenhouse Gas Inventory Methodologies*”, Yona et al. studied the processes that led to the development of the IPCC Methodologies for GHG accounting and reporting, a crucial aspect of the reporting and verification system of the UNFCCC. The authors identified gaps between current peer-reviewed scientific literature and inventory guidelines, highlighting how this would have a major impact on reports since the IPCC does not produce research on its own. The team conducted semi-structured interviews and studied the structure of the IPCC TFI to schematize what inputs the working group receives and how much the process of developing and publishing GHG Reporting methodologies is influenced by external factors such as member governments' preferences. The results show that a series of issues emerge when discussing the publication of these guidelines: first of all, the TFI reports knowledge gaps that might be filled in by including more experts in the compilation of methodologies; limited resources are also a major issue, and interviews showed that the possibility of conducting original and independent research would positively affect the outcomes of the working group; finally, this would also positively impact issues inventory discrepancies as “more accurate GHGIs [Greenhouse Gas Inventories] might impact climate policies”. In turn, improvement in these areas would reduce the probability of incurring obstacles regarding diverging logic and timeframes of the Guidelines, increase the trust between different groups and stakeholders in the science-policy nexus, avoid procedural lock-ins and resource constraints, and better manage external inputs that might influence the development of GHG reporting methodologies. In conclusion, the authors declare that more research on this organizational body of the IPCC is needed as “GHGIs are, indeed, essential to the success of the Paris Agreement […] [and] efforts to improve GHGIs will therefore help ensure that climate policies […] will be expected to lead to effective and durable climate action”. (Yona et al., 2023)

This State-of-the-art review of the topic discussed in this thesis serves as useful for identifying and scoping the research area and the main authors that contributed to its early formation: the first half of the chapter explores how the issue of the military emissions gap stayed under the radar of academics and experts until recent years, where the topic started being discussed again also thanks to new advocacy and civil society groups that began to shed light and conduct independent research on it. The inclusion of both social and natural scientists in the debate highlighted the importance of interdisciplinarity and cooperation between different epistemic groups. The review also showed that the strain of literature still has to define itself systematically, as different authors tackle the issue under different points of view and adopting diverse methodologies, but the high degree of interlinkage between them, also shown in how frequently they cite each other, suggests that a new field of research is forming revolving around the "military emissions gap" topic.

In the second half of this review, literature on the Science-Policy interface is presented: this literature has been linked to Haas's epistemic communities' theory and generally analyzes the relationship between scientists and decision-makers at various levels. The proposed literature analyzes first a set of issues that intertwine with themes such as the philosophy of science, applied to the case of environmental expertise. It then proceeds to explore how the general issues of the science-policy nexus apply to the case of the IPCC and climate governance, including studies on the various WGs that compose the organization and publish periodic ARs providing the most up-to-date scientific knowledge on Climate Science. Finally, an analysis of the under-researched IPCC TFI group shows that even within this unique, impressive, and global organization, issues that involve politics exist and have a profound impact on crucial features of the UNFCCC, such as the reporting methodologies of GHGIs.

II- Theoretical Framework, Methodology, Data Sets, and Thesis Structure

2.1 – Hybrid Framework

The analysis presented in this thesis will follow a hybrid theoretical framework. The distinct parts of the presented work will be discussed with different analytical frameworks, all inserted within the larger "Science-Policy Interface" theme following the "epistemic communities" theory. The "Policy" section will utilize Historical Institutionalism and Constructivism, while the "Science" section will comprise elements from the Science-Policy Nexus and Constructivism. Both sections will also implement minor elements of discourse analysis.

The interaction between these two epistemic communities creates then, according to the analysis, a negative feedback loop that has operated for the last 32 years of climate governance, producing what has come to public knowledge as the "military emissions gap". A schematic version of the hybrid framework is provided in Figure 2.1.

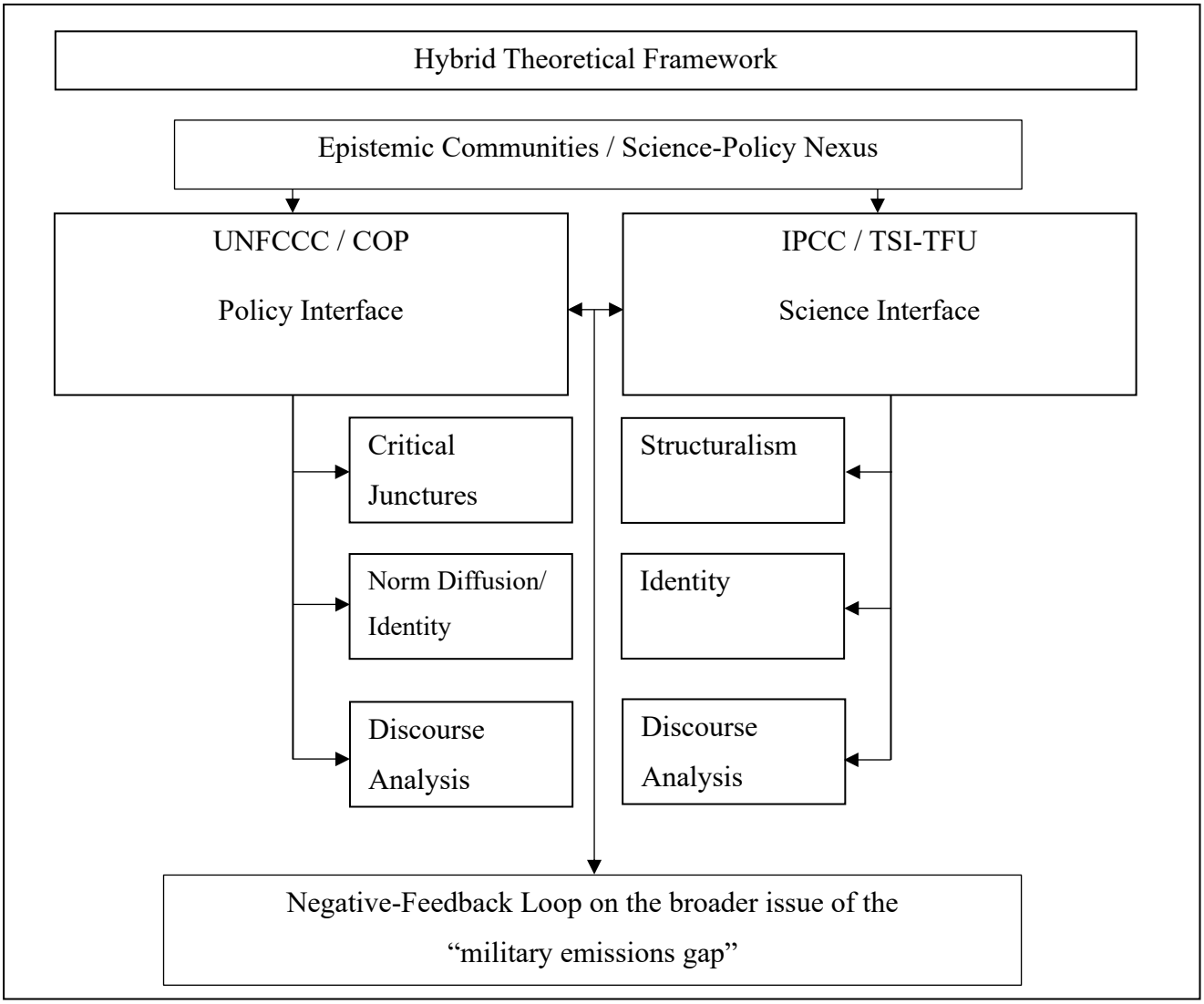

Figure 2.1 Theoretical Framework

2.2 – Critical Junctures and Path Dependency

The first part of this thesis covers the history of the "military emissions gap" that originated within the institutional framework of the United Nations Framework Convention on Climate Change of 1992. Historical Institutionalism is useful to trace back the moments when this issue was first identified and the key decisions that have defined it over time.

Historical Institutionalism has tried to identify institutions with "organizations and the rules or conventions promulgated by formal organization" and has "been especially attentive to the relationship between institutions and ideas or beliefs" (Hall 1996) that produce a "path dependence" process. This process can be of two types: a "self-reinforcing sequence" that reproduces the institution or the form it took over time, or a "reactive sequence" that creates a "key breakpoint" in history, therefore producing a "series of reactions that logically follow from this breakpoint" (Mahoney, 2000). These "key breakpoints" can also be referred to as "critical junctures", or rather "relative short periods during which there is a substantially heightened probability that agents' choices will affect the outcome of interest" (Capoccia and Kelemen, 2007); however, a critical juncture does not necessarily refer to change: as Capoccia and Kelemen state, "if change was possible and plausible, considered, and ultimately rejected in a situation of high uncertainty, then there is no reason to discard these [near-misses] cases as "non-critical" junctures"; finally, a critical juncture in the case of political institutions and policy-making processes should include the element of power, as "influential actors -political leaders, policymakers, bureaucrats, judges- […] [might] steer outcomes toward a new equilibrium". (Capoccia and Kelemen, 2007)

Historical Institutionalism and its key features, Critical Junctures, and Path Dependence will then be useful to analyze and identify the crucial moments where the "military emissions gap" has formed and perdured for over thirty years of climate agreements. The recent literature on this topic has highlighted his current iterations, but never delved into a historical analysis of how the current state of affairs came to be.

Historical Institutionalism alone, however, presents some limits given its broad scope and focus on long-term developments. One limit of particular interest to this thesis is the concept of "power asymmetries" and "key actors" that Capoccia and Kelemen insert into the theoretical framework of the theory. The authors conceive "power" as a "key dimension of politics" that is utilized by "influential actors […] [that] steer outcomes toward a new equilibrium" (Capoccia and Kelemen, 2007). While power is, indeed, an important aspect that characterizes climate negotiations, force, or "hard power" is not a viable option to negotiate climate agreements.

Moreover, this concept of power does not indicate how the “influential actors” exert their influence or explore any possible reason that reaches behind mere practical and concrete consequences, as the authors bring the example of road circulation after Napoleon’s war campaigns as an example of implications dictated by power.

Thus, this theoretical framework will also include a form of power proposed by constructivist scholars that has challenged conventional or “rationalist” ideas of power by including culture, ideas, norms, and identity as critical features of what can compose the idea of “power”. These are particularly useful while discussing climate negotiations since these serve the purpose of solving an issue of collective responsibility that mainly requires radical changes to our behavior and frame of mind to be effectively tackled.

2.3 – Constructivism, Norms, and Identity

Constructivism is a social theory of international relations that tries to "conceptualize the relationship between agents and structures", placing focus on culture, ideas, norms, identity, and other social aspects that might influence international politics and departing from other rationalist approaches like liberalism and realism. Constructivism emphasizes the socially constructed nature of the relations between actors and the environment in which they operate.

To particular use of this thesis, the concepts of (i) norms and their life cycle, (ii) collective agency/responsibility, and (iii) identity are key elements that determined the creation and endurance of the "military emissions gap" over the years.

The concept of norms and their life cycle has been deeply explored in Finnemore and Sikkink's groundbreaking article "International Norm Dynamics and Political Change" back in 1998. The authors defined a norm as a "standard of appropriate behavior for actors with a given identity", and differentiated this from the concept of institution, determined as "the way in which behavioral rules are structured together and interrelate (a "collection of practices and rules")". Norms can either be regulative or constitutive, with the former aiming at "order[ing] and constrain[ing] behavior" and the latter at "create [ing] new actors, interests, or categories of action". Finnemore and Sikkink also explain how international norms are deeply intertwined with domestic ones, and usually follow a domestic-to-international pattern of evolution, which in turn enables the "channel[ing] and regulariz[ation of] behavior […]. Shared ideas, expectations, and beliefs about appropriate behavior are what give the world structure, order, and stability". (Finnemore and Sikkink, 1998)

A norm, therefore, follows a "life cycle" structured in three phases: the first stage is that of "norm emergence", where a group or individual calls attention to or defines an issue "by using language that names, interprets, and dramatizes them". The main actors during this phase are "norm entrepreneurs" that operate within an "organizational platform" and use "expertise and information to change the behavior of other actors". The norm then "must become institutionalized in specific sets of international rules and organizations" to reach its second stage of life, and within this specific process "some states [become] critical to a norm's adoption". (Finnemore and Sikkink, 1998)

The second stage of the norm is that of "norm cascade", which is obtained through socialization, defined as a process where "networks of norm entrepreneurs and international organizations act as agents of socialization by pressuring targeted actors to adopt new policies and laws and to ratify treaties and by monitoring compliance", creating a "peer pressure"

momentum that responds to the motives of "legitimation, conformity and esteem". This process can also take place at the state level where leaders "conform to norms in order to avoid the disapproval aroused by norm violation" (Finnemore and Sikkink 1998).

Finally, stage three of the norm life cycle is that of "internalization", or the stage when a norm has acquired a "taken-for-granted quality that makes conformance with the norm almost automatic". Hence, "internalized norms can be both extremely powerful and hard to discern", thus also enabling a process of "isomorphism among states and societies" bringing certain values to acquire more importance above others. (Finnemore and Sikkink 1998)

In the end, Finnemore and Sikkink state that norms help channel and direct behavior within a socially constructed structure and that "under a logic of appropriateness, [norms and] notions of duty, responsibility, identity, and obligation may drive behavior as well as self-interest and gain".

The most important norm that has been discussed within the context of the UNFCCC and its development over time is that of Common But Differentiated Responsibilities (CBDR), embedded in the concepts of Collective Responsibility and Collective Action. Scholars have widely debated around this concept and its nature as a "philosophical principle" rather than a "legal" principle; its evolution over time within the climate governance system and the domestic organization of nation-states, as well as its ultimate "failure" due to not reaching the stage of internalization, caused by the inability of "entrepreneurs" to strengthen and unite behind the norm, and the extreme level of contestation that derived from the two just mentioned motives. (Rajamani 2000, McManus 2009, Pauw et al. 2014, Lawford-Smith 2020, Sade 2023, Kolmas 2023)

Additionally, identity also plays a major role in both the policy and science interface, where the two "epistemic communities" interact and influence each other as designed by the structure of the UNFCCC Governance System. Norms and identity are perceived differently between the two poles of the nexus, and their interpretation is subject to the type of expertise that members of the two communities bring to the tables. In this regard, the Epistemic Communities theory conceptualized by Haas is useful to better identify how two different groups of experts shape their ideas and how different backgrounds can lead to different interpretations of the same norms, or how different perceived identities shape the idea of what kind of role and actions might be ascribed to the members of a community. The insertion of the Epistemic Communities theory into this framework will help better distinguish the relationship between Policy and Science in the climate governance system.

2.4 – Epistemic Communities

The concept of "Epistemic Community" was first introduced by Haas in 1992 as a "network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area"; the key features of an epistemic community are the sharing of a "set of normative and principled beliefs, […] causal beliefs, […] notions of validity […] and a common policy enterprise […] out of the conviction that human welfare will be enhanced as a consequence". (Haas 1992)

The main objective of an epistemic community is, according to Haas, to exert the "political influence that [said community] can have on collective policymaking" and in particular the contributions from specialists, for example, scientists, "are themselves function of prior interests and are influenced by factors such as language usage" (Haas 1992). An epistemic community is, thus, a "concrete collection of individuals who share the same worldview" that has the potential to infiltrate the political space and influence governance processes within an organization, laying the "groundwork for a broader acceptance of the community's beliefs and ideas about the proper construction of social reality". (Haas 1992)

Within the UNFCCC, two epistemic communities are found: a "Policy/Diplomatic" pole (Conference of Parties) and a "Science" pole (the IPCC), which must interact together to progress the objectives of the convention. The roles of the two are clearly defined: the COPs are tasked with making political decisions, while the IPCC is mainly tasked with informing policy with the latest up-to-date scientific knowledge on climate change.

The two spheres speak "different languages" and "think with different concepts" (Jamieson 2014), but are expected to collectively act and, after their task, provide cooperation and mutual strengthening over time to tackle the issue of climate change. Discussions on the roles of the IPCC and its linkage to the political spheres have been taking place over the years, and the "linear nature" that originally characterized this relationship (with the notorious. principle that "truth speaks to power") has received various. critiques (Robinson 2004), especially after more in-depth studies of the "science-policy nexus" have shown that interactions between the two are not so linear. To this end, the deconstruction of the separated image and narrative of the two by analyzing, for example, the structure and identity of the IPCC has been crucial. (Robinson 2004, Carraro et al. 2014, Jamieson 2014, Yona et al. 2018, Lucas 2021, Asayama et al. 2023, Hermansen et al. 2023)

Epistemic communities have therefore played a significant role in the development and evolution of the Climate Governance system, and their constant interactions and intertwining

has proved of relevance for the issue of military emissions, too. This thesis will then not only discuss the "political" aspect of the military emissions gap (first half) but also engage a debate on the "scientific" side of it (second half), proving that the two communities contributed both to the spread and endurance of this gap over the years.

As the two epistemic communities have become closer and more interconnected over the years, scholars have started to indicate the IPCC as a "boundary organization" that operates at the borders between Policy and Science (Mahony and Beck, 2018). As a final component, then, the proposed theoretical framework will include parts of discourse analysis that will be applied to both the "Policy" and "Science" interfaces of the nexus: in particular, similarities in language adopted via decisions, declarations or publications will be the proof of the hybridization and evolution of the concept of distinct "Epistemic Communities" that interact unidirectionally towards the conceptualization of "boundary work" proposed by Mahony and Beck. In particular, specific sections of the works published by the IPCC TFI will show how norms and identities have behaved more fluidly over the years, moving back and forth between scientists and policymakers and influencing each other in a flow that resembles more a loop rather than a unidirectional, vectorial flow.

2.5 – Discourse Analysis

The final element of the presented theoretical framework is discourse analysis. This will be applied to certain norms that have emerged, endured, and crystallized in over thirty years of climate governance.

Critical discourse analysis theory will prove useful to identify a "proposition which was taken commonsensically given by all members of some community and seen as vouched for by some generally accepted rationalization", and that in turn create an "ideological-discursive formation" (IDF) that forms "between different forces within the institution". This "naturalization" of an ideology, in this case militarism and exemptions on accounting of emissions related to its activity, becomes taken for granted. Thus, critical discourse analysis will be utilized to analyze the macro-social structures that get reproduced and would make "visible the interconnectedness of things". (Fairclough, 1985)

Discourse analysis allows us to look at norms as "both resources for interpretation of action, […] as well as constraining in regards to action", as discourse and language will "orient" to a normalized, or internalized norm. This orientation, however, is "open to negotiation, mutable, and to a certain extent take[s] on different meanings in different situations, yet still function[s] to constrain the range of […] action". (Hall 1988)

In turn, the influence of militarism as an ideology that does preclude issues of responsibility in climate change can be either normalized "bottom-up by generalizing mental models to socially shared and normalized mental representations", or "top-down by explicit ideological instruction or ideologues of various kinds [including, military organizations in this case]" and can be analyzed through "texts and contexts". (Van Dijk, 2007)

While this thesis will adopt discourse analysis in very scoped and limited contexts, it will serve to prove that the linguistic and discursive repetition of internalized articles, norms, and other provisions over time provides yet another instrument to produce path dependency. This is visible by the fact that the same language has been used to describe issues related to military emissions by both the Policy and Science interfaces, reinforcing it through discursive means.

2.6 – Methodology, Data Sets, and Thesis Structure

This thesis will be divided into two parts: the first will analyze the "Policy" Interface, or the political epistemic community, and the second part will analyze the "Science" Interface, or the scientific epistemic community. Two case studies will be analyzed in the latter part of this thesis: Japan and the Republic of Korea. The reason to choose these two countries is that Japan is the main Annex I Country in the Asia-Pacific region, is in the top 10 military spenders worldwide (SIPRI, 2022), and has pledged to reach net-zero emissions by 2050 (Government of Japan, 2020). On the other hand, the Republic of Korea is a Non-Annex I Country but shares a higher military budget compared to Japan (SIPRI, 2022) and presents a similar level of economic development. Both countries are strong allies with the United States and participate in joint exercises and cooperation with them, both in civilian and military terms. The ROK pledged to climate neutrality by 2050 as well, according to the Climate Action Tracker.

Recent events such as the adoption of climate strategies by defense sectors and the first Leaders' Summit on Climate Change of 2021 will be presented in the appendix but not included in the theoretical framework, as they provide materials too recent and new to be included in the analysis of this thesis. The first Biennial Transparency Reports (BTRs) under the Paris Agreement should also be submitted and published by Parties in 2024 but will be just mentioned in the eventuality of their publication by the UNFCCC during the writing process of this thesis.

The first part of the thesis will present the three major climate treaties signed these days: the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol (KP), and the Paris Agreement (PA). Both original texts and drafts will be illustrated and analyzed.

To highlight the issue of the military emissions gap in a historical institutional method, declassified documents from the negotiations of the Kyoto Protocol provided by the U.S. via the FOIA will be utilized. Decisions from the COPs, Conference of Parties to the Kyoto Protocol (CMP), and Conference of Parties to the Paris Agreement (CMA), as well as decisions taken by the Subsidiary Body for Scientific and Technological Advice (SBSTA), will form part of the discussion as well.

Finally, to "close" the section dedicated to the Policy interface, the Guidelines for the documents to be submitted for the Measurement, Reporting, and Verification system of the UNFCCC (MRV) and the guidelines for the Enhanced Transparency Framework of the Paris Agreement (ETF) will be illustrated. These comprise the Reporting Guidelines for National Communications (NCs), National Inventory Reports (NIRs), Biennial Reports and Biennial

Update Reports (BRs/BURs) for the MRV; the Reporting Guidelines for Biennial Transparency Reports (BTRs) for the ETF.

The second part of the thesis will focus on the "Science" interface, and thus incorporate the analysis of IPCC Reports in their author's composition and the structure of the IPCC TFI and its Technical Support Unit (TSU); moreover, the IPCC Guidelines for National Greenhouse Gas Inventories of 1996 (1996 IPCC GL), 2006 (2006 IPCC GL), their refined version of 2019 and the 2000 Good Practice Guidance (2000 IPCC GPG) will be presented and researched to find any reference to military emissions. Additional data will be drawn from the IPCC Emissions Factor Database (EFDB), with a focus on Emissions Factors and Common Reporting Tables (CRTs) codes that contain the keyword "military".

To illustrate the case studies of Japan and the ROK, the analysis will focus on the following material: NCs, BRs, BURs, and Nationally Determined Contributions (NDCs) submitted to the UNFCCC, NIRs, CRTs, and domestic GHG reporting documents.

For the conclusion of the thesis, which presents the most recent and new developments on the issue of the military emissions gap, as well as a potential change of path for the future, the Leaders' Summit of 2021 and the contributions from defense ministries made to the event will be presented, as well as recent Climate Strategies published by Japan and the U.S.[2]. These documents will not be inserted in the framework of the analysis presented through this thesis as they provide a new approach to facing the climate crisis from defense institutions, but still lack any form of consistency or comparability. Future developments and publications may expand this thesis to include them as part of the research.

[2] ROK has not published one to this day.

III – The Climate Change Governance system and the military emissions gap

3.1 – Introduction

The global climate change governance system revolves around the United Nations Framework Convention on Climate Change (UNFCCC), the main international legal framework that deals with tackling climate change and its various adverse impacts. The origins of this legal instrument date back to the adoption of Resolution 45/212 by the United Nations General Assembly (UNGA) during its forty-fifth session in 1990, titled *Protection of Global Climate for Present and Future Generations of Mankind*, where it established the creation of a "single intergovernmental negotiating process under the auspices of the General Assembly, supported by the United Nations Environment Program and the World Meteorological Organization" (UNGA 45/212:1, 1990), in collaboration with the specific body of the United Nations tasked with studying and analyzing the science of climate change, the Intergovernmental Panel on Climate Change (IPCC). Hence, after two years of preparation, the United Nations Framework Convention on Climate Change was adopted and opened for signature in 1992 during the Earth Summit in Rio de Janeiro and immediately signed by 154 states and one regional economic integration organization. As for 2023, the convention has been signed and ratified by 198 parties, including 197 states and the European Union.

The objective is not clearly defined in quantity, marking evidence of the "difficulty of reaching a consensus among States, which, at this point, had radically different expectations from international cooperation on climate change" (Mayer 2018). The choice of creating a governance system structured around a framework convention signals the will of the parties to "delegate questions that are relevant for achieving the agreement's objectives to additional regulation" and create a "larger regulatory regime in a two-step [or more] procedure" (Matz-Luck 2009), where protocols are the specific and detailed treaties that take the role of the parallel or subsequent legal instruments that address specific issues within the main convention. As Matz-Luck argues, in the case of the climate change governance system, some political reasons were crucial in drafting a framework convention rather than a "regular" treaty, including the difficulty of reaching a consensus in such a critical area in a short period and allowing for the advancement of scientific research on the issue that may have impact and consequences on the later decision as the matter evolves. Thus, the decision-making process has been left in charge of the Conference of Parties over the years. (Matz-Luck 2009)

While the framework convention was rapidly accepted and drafted by many countries, the negotiation processes during the numerous COPs resulted in "characterized by controversies

over agendas, transparency, decision-making procedures, and interpretations, […] as well as various other procedural issues" (Vihma, 2014). These include the issue of settling military emissions reporting, partially inserted in the broader difficulty in reaching an agreement on international emissions (SBSTA 1999, 2003), which is still debated to this day and has not reached an agreement yet. (SBSTA 59/2023, Decision 12)

COP decisions remain then the main tool to "operationalize" the different possible agreements that are discussed by Parties, and they may prove to be the crucial moments where an instance of a critical juncture in the institutional and legal development of the climate change governance system may occur. By "critical juncture", I adopt Capoccia and Kelemen's definition as the relatively short time when there is a "substantially heightened probability that agents' choice will affect the outcome of interest" and provoke a path-dependency process that "constrains future choices" (Capoccia and Kelemen 2007). As for the development of the issue of military emissions within the UNFCCC, I propose the identification of three historical-critical junctures and link them to one identified and recognized structural issue related to the UNFCCC regime: the principle of Common But Differentiated Responsibilities (CBDR), which fall in the broader concept of collective action and responsibility. The three proposed critical junctures are the following: (i) the institution of the UNFCCC and in particular the adoption of CBDR, (ii) the negotiations of the Kyoto Protocol, and (iii) the adoption of the Paris Agreement. At the end of the analysis proposed in this thesis, a possible future fourth critical juncture is identified with the Leader's Summit of 2021 and the potential impact it had on subsequent developments within the international climate governance regime.

In my hypothesis, the combined effects of these critical junctures affected the life-cycle of norms pushed through international institutions and aimed at tackling climate change such as CBDR, which also entails acknowledgment and effective demand for transparent and complete reporting from the world's militaries. A "norm" is defined as a "standard of appropriate behavior for actors with a given identity" (Finnemore and Sikkink 1998); a norm usually follows a "life cycle" articulated in three phases before its full adoption: it must emerge first in an "organizational platform" from a set of agents or an individual who have "strong notions about appropriate or desirable behavior in their community", whose "expertise and information" can change the behavior of others and "helps or blocks the promotion of new norms withing standing organizations", with an emphasis on which states then decide to adopt the norm and which do not (Finnemore and Sikkink 1998). The norm then undergoes a process of "socialization", or "contagion", which is a "cumulative effect [that] puts peer pressure among

countries [to adopt a norm for the sake of] legitimation, conformity, and esteem". Finally, the norm becomes "internalized" and thus "extremely powerful and hard to discern" (Finnemore and Sikkink 1998). The critical junctures will serve as proof that CBDR has not been fully internalized by countries for different reasons, but still serves as the main principle leading climate decision-making. The norm has yet to be then internalized by Parties at different levels (international, regional, or even domestic) as the discussion on it keeps building over the years, and discontent grows among both the "entrepreneurs" and the Parties that should implement this norm (Kolmas, 2023). If this logic is applied to militaries, I, therefore, argue that instead of internalizing CBDR, a new "standard of appropriate behavior for actors with a given identity" has emerged from climate negotiations processes and climate treaties: the idea that military organizations can and should be exempted from reporting their emissions has then been the norm that was internalized by Parties, instead of a domestic version of CBDR. It is not true that CBDR loses its normative power though, as Parties have been keeping it as a cardinal principle, and as it still has had an impact on reporting requirements over the years.

3.2 – The UNFCCC – Paving the way towards climate governance

First Critical Juncture: the structural issue of CBDR.

The text of the UNFCCC follows the typical structure of international treaties, with its main objective stated in Article 2

> The main objective of this Convention and any related legal instruments that the Conference of Parties may adopt is to achieve […] stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. (UNFCCC 1992, Article 2)

The principles guiding the treaty are those of "equity and in accordance with common but differentiated responsibilities and respective capabilities" (CBDR) (UNFCCC 1992, Article 3.1), with a leading role given to developed country Parties; moreover, developing country Parties would be given "full consideration" of their "specific needs and special circumstances" as they were recognized as more vulnerable (UNFCCC 1992, Article 3.2); in addition, both adaptation and mitigation policies are given a special emphasis and should be driven by cost-efficiency, thus taking into account "different socio-economic contexts, [should] be comprehensive, cover all relevant sources, sinks, and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors" (UNFCCC 1992, Article 3.3); finally, the principles of sustainable development and non-discrimination are mentioned in article 3.4 and 3.5.

Article 4 of the convention defines commitments as follows: all the Parties are required, selecting articles relevant to this thesis, to:

a. Develop, periodically update, publish, and make available […] national inventories of anthropogenic emissions *by sources* and removals by sink […], using comparable methodologies to be agreed upon by the Conference of Parties.
b. Formulate, implement, publish, and regularly update national and […] regional programmes containing measures to **mitigate** climate change […], and measures to facilitate adequate **adaptation** to climate change.
c. Promote and cooperate in the development, application, and diffusion […] of technologies, practices, and processes that control, reduce, or prevent anthropogenic emissions of greenhouse gases […] in *all relevant sectors*.
d. Take climate change considerations into account, to the extent feasible, in their relevant social, economic, and environmental policies and actions […] (UNFCCC 1992, Article 4.1)

Moreover, the insertion of climate change considerations while developing social, economic, and environmental policies and actions and the importance of promoting ways to educate, train, and raise awareness within the public about climate change issues through the channels of non-governmental organizations are placed under the same article and thus referred to as "commitments" (UNFCCC 1992, Article 4.1.f; 4.1.i).

Article 4.2 states more specific obligations for a set of determined Parties defined "Annex I" and identified as the "industrialized countries that were members of the OECD (Organization for Economic Co-operation and Development) in 1992, plus countries with economies in transition (the EIT Parties)" (UNFCCC Secretariat). The more compelling and detailed commitments these Parties must undertake comprise, among others,

a. "[the adoption of] national policies and […] corresponding measures on the *mitigation* of climate change, by *limiting its anthropogenic emissions of greenhouse* […].
b. "[the communication of], within six months […] and periodically thereafter, […] detailed information on its policies and measures, […] as well as on its resulting projected anthropogenic emissions by sources […] with the aim of returning individually or jointly to their 1990 levels […]; (UNFCCC 1992, Article 4.2a; 4.2b)

Article 4.2.g opens the possibility of being bound by 4.2.a and 4.2.b to Non-Annex I Parties at any moment.

The other provisions under Article 4 of the UNFCCC cover topics such as aid from an even smaller number of countries, defined as Annex II, which comprise OECD members only and are required, in order, to (a) provide aid to developing countries Parties that are vulnerable to the adverse effects of climate change in facing their adaptation costs; (b) take a leading role in the transfer of funds through financial mechanisms that would have been developed under the umbrella of the Convention; (c) take into consideration the specific needs of some categories of developing countries, especially small island countries, and those who would be classified as Least Developed Countries (LDCs).

Article 5 of the Convention demands that research and systematic observation at both international and intergovernmental levels be conducted regularly.

Article 6 asks to encourage and stimulate education and public awareness of climate change and its effects, to provide easy and accessible information, and to train personnel about climate change. It also pushes for cooperation at the international level in material exchange and the training of experts.

Subsequent articles establish a Conference of Parties (COP) as the main body of the convention, in charge of reviewing and checking the progress made by Parties and their intents, developing new legal instruments, and deciding overall on how to "promote the effective implementation of the Convention". It also has the role of promoting, creating, and guiding the implementation and development of methodologies for the preparation of inventories of GHG emissions. Sessions of the COP have been mandated once per year every year, except for COP26, which was held in 2021 instead of 2020. A secretariat, a Subsidiary Body for Scientific and Technological Advice (SBSTA), a Body for Implementation (SBI), and a Financial Mechanism are also created within the framework of the convention. (UNFCCC 1992, Articles 7-11)

Article 12 defines the modalities of the report and verification system of commitments under Article 4.1; accordingly, each Party is requested to communicate a "national inventory of anthropogenic emissions by source […] of all greenhouse gases not controlled by the Montreal Protocol, […] using comparable methodologies […], a general description of steps taken or envisaged by the Party to implement the Convention […], and any other information […] relevant to the achievement of the objective of the Convention […], including material relevant for calculations of global emission trends." (UNFCCC 1992, Article 12.1.a;12.1.b;12.1.c)

The NCs from Annex I Parties should also comprehend a detailed description of adopted policies and measures under Article 4, and their estimated effects. NCs must be delivered every four years for Annex I Parties; within three years of entering the convention, and every four years thereafter, for Non-Annex I Parties. Thus, the main instrument that allows the system to work is the submission of NCs and NIRs. The guidelines for these documents would be adopted during subsequent COPs and updated over time to reflect the advancement of scientific research with the work of the IPCC.

The remaining articles settle matters related to the settlement of disputes, amendments, annexes, protocols, voting rights, and other bureaucratic issues. Finally, any Party is allowed to withdraw from the Convention at any time nowadays, given proper notification to the Depositary. (UNFCCC 1992, Articles 13-25)

Despite its general acceptance, the UNFCCC presents some structural issues that provoked extensive debate on some of its principles over the years, in particular regarding the CBDR, a principle intertwined with structural inequality that falls in the more general notion of collective action and responsibility.

The issue of structural inequality was heavily and notoriously discussed in Parks and Roberts in 2009, where the authors identified three forms of inequality that characterize the UNFCCC regime: climate-related inequality, described as the differences in emissions and abilities to combat them, which intertwines with inequality in the political and economic regimes (Parks and Roberts, 2009); this issue led to the adoption of the CBDR principle and the differentiation between Annex I and Non-Annex I parties, which in turn enabled and crystallized the practices of easily stalling and complicating negotiations, as proven by the recurring difficulties in reaching climate agreements. CBDR has therefore long proved itself to be a static rather than dynamic principle. (Pauw et al., 2014)

It is then clear that a "single fairness principle" is not sufficient to settle inequality issues, but the will to reach a "negotiated justice settlement" appears to be absent from current climate negotiations, as the CBDR remains the main principle guiding climate-related decision-making processes, even with its contemporary evolution in a "according to national circumstances" formula. The CBDR principle has been discussed several times over the years: its nature as a "guiding ideal [rather] than a prescriptive principle" (Rajamani, 2000) has still provided the "legal and philosophical basis for the existing legal obligations" and theoretically assures "fairness to all parties […] via the concept of historical responsibility, […] different capacities and needs of nations, [and] asymmetric priorities and commitments for industrialized and developing countries" (McManus, 2009). Nonetheless, the dichotomous structure of the UNFCCC proved again to be static and did not allow any "dynamic diversification" (Pauw et al., 2014) over time of the two categories of parties.

CBDR then allows Parties to report at different scales and scopes by adopting the "Annex I" and "Non-Annex I" categories: even after thirty-two years of economic, social, and scientific development, the division of parties barely underwent modifications (the only countries that were moved from Non-Annex I to Annex I were Cyprus, Liechtenstein, Malta and Monaco), as this process requires consensus and is not automatically adjusted to GDP levels over the years or by emission levels. Emissions caused by Non-Annex I Countries have been constantly increasing over the years (Meng, Liu, et al., 2023): in the top ten countries for total emissions in 2020, eight of them were Non-Annex I countries, accounting together for around 48% of global GHG emissions (EDGAR, 2023). Structural reform for the UNFCCC and its bodies has been addressed by several scholars (Vihma and Kulovesi, 2013; Prys-Hansen, 2020; Lucas, 2021) in both the CBDR principle and the decision-making processes, but no fundamental modifications to it have been made to this date. In particular, Harris and Symons proposed to

migrate from a "production-based" towards a "consumption-based" accounting approach, to revive both the CBDR principle in a more equal way, and potentially allow "differentiated responsibility to be implemented through policies targeting high-consumption lifestyles everywhere". (Harris and Symons, 2013)

The static structure created by the CBDR principle, moreover, is further reflected in the UNFCCC reporting guidelines that Parties have to follow in compiling their National Communications, especially GHG Inventories, which are then reviewed by the UNFCCC and allow the tracking of progress in combating climate change. In particular, Annex I countries are recommended to utilize the 2006 IPCC Guidelines in compiling their GHG Inventory Report, while Non-Annex I are recommended to adopt the 1996 IPCC Guidelines *even to this day*.[3]

This opened discussion on the nature of CBDR within the context of the broader issue of Collective Action, Harm, and Responsibilities for Climate Change (Hormio, 2023). If the argument is scoped to military organizations, the debate evolves in terms of to what extent should a branch of a State be deemed responsible for its share of emissions, and what would be an acceptable demand for its emissions to be accounted for and reported. According to some scholars, States should then be accountable for reporting their military emissions as they are a state branch that directly emits GHGs (Lawford-Smith and Eriksson, 2020), but the CBDR principle, as it is interpreted in the UNFCCC, allowed the demand of different requirements to different countries, and, consequently, their military organizations as reporting guidelines differ in scope and required completeness in the coverage of sectors.

Furthermore, the CBDR becomes even more problematic since modern armies and military expenditure have been rapidly increasing over the years at such a rate that the latest SIPRI Report indicates that 2023 scored a +3,2% over 2022 and set a new record high (SIPRI, 2023). Militaries are becoming increasingly recognized as huge GHG emitters and their operational foundation relies on fossil fuels (Clark et al., 2010; Jorgenson et al., 2012; Belger et al., 2019; Crawford, 2022; Jorgenson et al., 2023). On top of this, among the top 10 highest military spenders in 2022, five of them are Non-Annex I countries, including now-developed countries like the ROK (SIPRI, 2023). This data alone could be yet another criticism of the CBDR principle: it failed in being fully internalized within countries, where different organizations should bear different responsibilities according to their contribution to national emissions. (Lawford-Smith and Eriksson, 2020). Adopting a "consumption-based" approach to CBDR

[3] The guidelines will be discussed deeply further in this thesis.

would, for example, highlight the massive amount of fossil fuel consumed by militaries all over the world, and apply a better understanding of the notion of collective responsibility in tackling climate change through emissions reporting, and therefore limitation.

The CBDR has then served as the underlying principle of the historical development of the UNFCCC and has influenced virtually every issue discussed by the COPs[4]. I argue that the adoption of the CBDR principle within the broader UNFCCC negotiations is then referrable as a Critical Juncture and a structural deficiency of the framework, as it opened a dependency path where all of the most important climate treaties were negotiated and adopted on its theoretical-philosophical basis. This fundamental critique of the CBDR principle also expanded to the realm of constructivism, with authors claiming that the principle has never been effectively internalized by developed countries, thus dissatisfying the Global South who started to not back it up on a united front; this tension ultimately prevented the "coherent political implementation" of the norm within Parties (Kolmas, 2023). In practice, this meant that the CBDR norm formally created a harsh dichotomy in reporting requirements; the failed internalization of the norm, though, also did not allow for "differentiating responsibilities" thoroughly within national agencies, allowing for specific interests to overcome collective action.

This structural deficiency applies particularly well to the case of defense agencies/military organizations. The next section will introduce and discuss the critical juncture that has led to the exclusion of consistent reporting of military emissions within the UNFCCC: the U.S. intervention during the Kyoto Protocol negotiations.

[4] Every major climate agreement cites CBDR.

3.3 – The Kyoto Protocol – The pivotal moment for the military emissions gap

Second Critical Juncture: the U.S. intervention during the negotiations.

The Kyoto Protocol (KP) has been the first legal instrument adopted under the umbrella of the UNFCCC that has the objective of reinforcing the commitments of Annex I Parties *only* under Article 4.2.a, 4.2.b, and helping the Parties elaborate more detailed and effective policies and measures, as well as setting "quantified limitation and reduction objectives within specified timeframes […] for their anthropogenic emissions by sources […]." (Decision 1/CP.3, 1997)

Article 3 of the Kyoto Protocol mandates Quantified Emission Limitation and Reduction Commitments (QELRC) for Parties included in the Protocol (Annex B Parties, who are the same Annex I Parties of the UNFCCC) on a set list of greenhouse gases inserted in Annex A of the Protocol; these commitments are prescribed to hit at least "5 percent below 1990 levels in the commitment period 2008 to 2012" (Kyoto Protocol 1997, art. 3), including a specific "pursue limitation of emissions of greenhouse gases […] from aviation and marine bunker fuels, working through the International Civil Aviation Organization [ICAO] and the International Maritime Organization [IMO] […]." (Kyoto Protocol 1997, art. 2.2). The covered sectors under the Protocol are Energy, Industrial Processes, solvent and other product use, agriculture, and waste, mimicking those of the 1996 IPCC Guidelines. (Kyoto Protocol 1997, art. 3.1)

Article 5.1 defines obligations for Annex I Parties for the creation of a national system that would be used to estimate "anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol" (Kyoto Protocol 1997, art. 5.1); the chosen methodologies for achieving this estimate are those developed and accepted by the IPCC and agreed by the COP during its third session (Kyoto Protocol 1997, art. 5.2), or the 1996 IPCC GL.

All this information was required to be submitted within the National Communications that Parties must present under the UNFCCC original treaty. (Kyoto Protocol 1997, Article 7)

Articles 6, 12, and 17 define some flexibility mechanisms aimed at allowing Annex I Parties to acquire, from each other, "emission reduction units resulting from projects aimed at reducing anthropogenic emissions by sources or enhancing anthropogenic removals by sinks […] in any sector of the economy […]" (Kyoto Protocol 1997, art. 6); the "clean development mechanism" allows Annex I Parties to undergo certified project activities, in cooperation with Non-Annex I Parties, that would create "real, measurable and long-term benefits related to the mitigation of climate change": these activities would grant Annex I Parties the same emission reductions

units that could be used in meeting their emission limitations and reduction commitments under the Protocol (Kyoto Protocol 1997, art. 12); Annex B Parties are also allowed to engage in "emissions trading to fulfill their commitments under Article 3". (Kyoto Protocol 1997, art. 17)

The Protocol is open to amendments as to Article 20, and every Party can withdraw after three years from the date of entrance into force of the legal instrument, according to Article 27.

Decisions regarding the KP are taken by the COP, which also serves as the CMP, starting from the same year the Protocol would enter into force, and open to even Parties who are not members of the Protocol with the role of observers, whether they are national, international, governmental or non-governmental bodies or agencies. (Kyoto Protocol 1997, article 13)

Reporting of the GHG emissions of a Party under the KP should follow the IPCC 1996 GLs (CP3/1997, add.1). Under the KP, domestic military emissions are then required to be included in inventory reports, according to the IPCC Guidelines, but "emissions based upon fuel sold to ships or aircraft engaged in international transport should not be included in national totals", and "emissions resulting from multilateral operations pursuant to the Charter of the United Nations shall not be included in national totals", thus exempting overseas military activities from being accounted for and inserted in the QELRC system. The COP then formally requested the SBSTA to further discuss the inclusion of international bunker fuels in GHG inventories in their future meetings (CP3/1997 Add. 1.4, 1.5).

The origin of this exclusion is found in the negotiation process of the KP, when the U.S. negotiators pushed for the exclusion of military emissions over "security concerns" and pressured by the U.S. DOD. In fact, during the negotiations, the Pentagon produced and shared a paper with the KP negotiators where it stated its opposition towards the inclusion of limitations to military emissions in the protocol, exerting pressure for the insertion of "National Security" clauses. In particular, the original demands were the following:

> "In Article 1, Definitions Section, insert the following definition and number appropriately: "Military tactical or strategic systems" means equipment, vehicles, aircraft, and vessels designed or procured for use in military operations."

and

> "In Article 3, Measurement and Reporting, insert the following and number appropriately: Each Annex A and B Party shall exclude from its measurement of anthropogenic emissions by sources any emissions attributable to military tactical or strategic systems used for military operations in support of national or collective security, humanitarian activities, peacekeeping, peace

> enforcement, or United Nations, NATO, and other multinational actions and any such emissions attributable to military tactical or strategic systems used in training to maintain readiness for conducting military operations" (DOD, reported in Berenson, 1997)

The paper was accompanied by an analysis from the Pentagon on how a hypothetical 10% reduction of GHG emissions from the army would hinder military training, with specific calculations from the ground, marine, and air forces: in general, the Pentagon found out that these emissions cut would mainly impact training operations, with around 330,000 fewer miles traveled by tanks, "2000 steaming days per year" for deployed ships, and around 210,000 flying hours per year. The DOD then rejects emissions cuts in the name of the non-addressing of "possible threats to national security that will emerge in the future" and deems "nearly impossible" for the agency to "consistently meet a set target to reduce its greenhouse gas emissions", and finally advised to not "put national security goals into conflict with international environmental obligations". Therefore, "DOD strongly recommends that the United States insist on a national security provision in the climate change Protocol now being negotiated". (DOD, reported in Berenson, 1997)

These requests were not fully adopted in the final decisions regarding the KP but were discussed both with other Parties and heavily debated within the U.S. delegations and the national government. Declassified documents show ongoing dialogues between various. national agencies on diverse issues regarding the KP, including that of military emissions: doubts from the U.S. government ranged from operational issues to the impact of the protocol on domestic military emissions (State Dept., 1997; Council on Env. Qual., 1997), to whether this exemption would be acceptable to other parties to the negotiations or not, and noted a growing frustration with the behavior of certain countries (especially China and Russia) that were strongly opposed to the national security clause; the EU was also deemed "not particularly helpful" on the matter, provoking a "serious setback" on the military provision to the KP (Hambley, 1997); the growing interest of arms lobbyists was also noted throughout the negotiations process, where "the impact of the climate treaty on the military has received growing attention […] among industry groups opposed to the treaty". (Sperling et al., 1997)

The final package proposed to other negotiators from the U.S. delegation finally included the exclusion of domestic military emissions from Emissions Trading Schemes (ETS), the accounting of overseas stationary emissions into U.S. national totals, and noted the difficulty in arranging a solution for exempting "surge operations", a matter so crucial to the DOD that it even suggested not joining any agreement in the absence of such a provision (Sperling et al.,

1997). These three proposals were discussed first with a group of countries that initially showed interest in settling the issue: Japan, Canada, New Zealand, Australia, Norway, the U.S., and Switzerland (JUSCANZ). The issue was also deemed as one of a "methodological" nature, thus bringing the debate to the SBSTA (Hampley, 1997) and removing their political aspect by making it a merely technical matter. The JUSCANZ group then brought up the propositions and debated them with other Parties in the SBSTA session, but the negotiations "did not go smoothly": one interesting intervention was that of Japan, which asked for HFCs, PFCs, and SF6 to be calculated using a "preferred approach" defined by each party. The U.S. would "normally have objected except for the importance of the military exemption" (State Dept., 1997), showing that scientific knowledge (or at least information available to negotiators at that time) already recognized the usage of these gases in military applications, while the 1996 IPCC GL do not cover this particular usage in their methodologies.

By the end of 1997 and the drafting of the KP reaching a mature stage, the three above-mentioned provisions were reported as included in the decisions of the Parties, reaching a "major victory" in the negotiation process on national security exemptions (State Dept., 1997). On another domestic question session to the Council on Environmental Quality, the KP is stated to include "several provisions sought by the Department of Defense dealing with bunker fuels and so-called "surge" operations", finally claiming that "emissions from military sources […] can be handled through domestic means, entirely independent from the Protocol". (Office on Env. Qual., 1997)

After the drafting of the proposed final document of the KP, the U.S. State Department published a Fact Sheet in 1998, which stated that the three goals of the DOD were achieved. In particular, bunker fuels and emissions from multilateral operations, whether they are explicitly authorized by the UN or not, are "exempted from emissions limits", and finally accounting of overseas stationary military emissions would be freely managed by countries via the emissions trading scheme. (U.S. State Dept., 1998)

Despite this "major victory", unrest in domestic politics still affected the decision on the ratification of the protocol: discussions were held in 1998 right before the opening of the sign and ratification process of the KP when a list of politicians directly addressed to president Clinton suggesting not to sign the protocol, but still try to "correct some [decisions]", including the issue of exempting domestic military emissions, which would fall into the protocol's jurisdiction. The reason to do so is that it would "generate pressure from the U.N. to curtail the training and operations that have made our armed forces second to none" (Gilman et al., 1998).

Yet another Q&A session with the White House Office of Environmental Initiatives asked the reason for not pushing a "clearcut exemption" of all military emissions rather than the "flawed formula" presented in the KP document (White House, 1998), and one more targeting the State Dept. with the same question received the answer that the negotiations were a success since "ample room within the emissions reductions commitments" were given to the U.S. military emissions, "including any that might result from unilateral military actions", and that exempting military emissions, even more, would "overlook opportunities for the Federal government to make its operations more energy efficient [as] the DOD has already made significant strides in this area". (State Dept., 1998)

The debate ended by November of 1998, when the State Department published a paper that not only described the reasons for the formula that was adopted in the final document of the KP regarding military emissions exemptions but also provided a breakdown of emissions sources of the DOD: in particular, the Pentagon declared that the DOD utilizes 72% of the U.S. Federal agencies' total energy use, comprising *alone* almost 1,5% of the U.S. Total energy usage. The motivation provided for the adoption of the current national security formula stated that it was adopted to "ensure no nation would hesitate to join multilateral [operations] due to potential of exceeding emissions budget", "ensure no disincentives to allies making fuel available overseas" and "ensure the readiness of forces". In particular, national security is protected by the exemption of bunker fuels and multilateral operations in emissions reporting under national totals and the freedom in allocating "other" overseas military emissions; these decisions are deemed "not limited to the Protocol", thus appliable to all Parties of the UNFCCC. Moreover, domestic emissions were not impaired or adversely affected by the reductions in GHG emissions of the Kyoto Protocol by law (U.S. Congress, 1998). These would be included in national totals but addressed as either "administration policy" or aggregated to the private sector. (State Dept., 1998)

It is worth noting that this exemption did not fully occur blindly to the public. Already in 1998, the Washington Post published an article on the issue, citing internal sources to the DoD and covering the negotiation and internal political processes that led to this exemption (Warrick, 1998). The academia, too, noticed this exemption and promptly addressed it. Michaelowa and Koch proposed, as early as 1999, an analysis of military emissions with case studies and some practical solutions to the loophole generated by the KP (Michaelowa and Koch, 2001), but they received little to no attention during the period of publication, as recently stated by one of the

authors during a convention on military emissions held in October 2023. (CEOBS Conference, 2023)

Within the category of international bunker fuels, the SBSTA later officially decided that international military aviation and marine navigation were included in this category as well (SBSTA 1999, 8.4). During the same meeting, the SBSTA also stated that "fuel for military purposes is often confidential and hence difficult to estimate", but that "confidentiality concerns can routinely be overcome by appropriately aggregating military data at the national level", with the U.S. taking a stance in "strongly" supporting the adoption of new commonly shared reporting format where emissions caused by multilateral operations and derived from international bunker fuels would be included. For the task of settling the issues related to international bunker fuels, the UNFCCC asked the ICAO and the IMO to provide policy solutions and methodologies to be discussed and eventually adopted (SBSTA 1999, 8.4). By delegating the issue to these two organizations, international military activities were officially exempted from reporting requirements, as the focus would be placed on civil aviation and navigation as the ICAO and IMO's jurisdiction is only limited to those.

Thus, despite the stated intent of changing the state of things in 1999, the systemic exclusion of international military activities from reporting requirements has not been settled yet in 2023, as the latest SBSTA yet postponed the decision on the issue of international bunker fuels to future meetings (SBSTA59 2023, Decision 12). This proves that the initial decision of not including international emissions under the QELRC system has had a sensible impact on GHG reports from countries, and the difficulty in reaching a consensus on this matter is proof of the dependency path that originated from the U.S. intervention during the KP negotiations. More than so, the fact alone that U.S. Officials were the only representatives of military or defense institutions during the KP protocol negotiations further strengthened the thesis of the missed socialization process: military issues were not talked about between officials, but between civilians with the sheer influence of U.S. DOD members as the only military "counterpart". This powerful U.S. intervention can therefore be identified as a critical juncture in the historical and institutional process of the military emissions gap that has been reverberating until the present time, as proven by the most recent discussions in the SBSTA, and the failure of one of the most important and landmark climate treaties, the Paris Agreement, in settling the matter.

Finally, the outcome of the KP negotiations can be seen as the moment where a new "norm", namely that of exempting military emissions from quantified limitations or required reporting has emerged from the actions of an "entrepreneur" (the U.S. negotiation team that received

pressure by the U.S. DOD, and the JUSCANZ countries), went under the process of “norm cascade” by inserting the exemption in the reporting guidelines and labeling it merely as a methodological issue, and finally internalized as the “military emissions gap” was observed over the years. In turn, these outcomes represent well the notion expressed by U.S. Navy Official James Goudreau when he stated that the military’s job is “not to save the world, it is to protect the nation”. (Goudreau, reported in Semler, 2023)

3.4 – The Paris Agreement – Reforming Climate Governance

Third Critical Juncture: the choice of maintaining the status quo in military emissions reporting.

During COP17 in 2011, the Ad Hoc Working Group on the Durban Platform for Enhanced Action (AWG-DP) was created and tasked with developing "a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties [that would be adopted] at the twenty-first session of the Conference of Parties and for it to come into effect and be implemented from 2020**"** (Decision 1/C.P.17 2011, par. 2-4). The outcome shall comprehend every aspect related to climate change, including mitigation and adaptation efforts, and be informed by the Fifth Assessment Report of the IPCC, published in 2014.

The Paris Agreement (PA) opens with a reminder that "climate change represents an urgent and potentially irreversible threat to human societies and the planet" and recognizes that "deep reductions in global emissions will be required to achieve the ultimate objective of the Convention and emphasizing the need for urgency in addressing climate change", while also reminding the constant acknowledgment of the "specific needs and concerns for developing country Parties"; the Paris Agreement established an Ad Hoc Working Group on the Paris Agreement (AWG-PA) and a Meeting of the Parties of the Paris Agreement (CMA).

Article 2 of the Agreement states its ultimate objective:

a. Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels […].
b. Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emission development […].
c. Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilience development. (Paris Agreement 2015, art. 2)

Article 4 states an effort to "reach global peaking of greenhouse gas emissions as soon as possible […] as to achieve a balance between anthropogenic emissions by sources and removals by sinks […] in the second half of this century"; the means of doing so is the submission of a "nationally determined contribution" (NDC) from all Parties, which shall be progressively more ambitious, with Annex I Parties taking the lead by undertaking "absolute emission reduction targets"; NDCs should be submitted every five years and can be adjusted "to enhance [the] level of ambition"; in accounting their emissions and removals contained in

NDCs, the Parties should promote "environmental integrity, transparency, accuracy, completeness, comparability, and consistency". (Paris Agreement 2015, art. 4)

Article 6 established a non-market cooperation mechanism to "contribute to the mitigation of greenhouse gas emissions" in harmony with the concept of sustainable development, that would "incentivize and facilitate participation in the mitigation of greenhouse gas emissions by public and private entities authorized by a Party [and] contribute to the reduction of emission levels in the host Party" and "promote mitigation and adaptation ambition [and] enhance public and private sector participation in the implementation of nationally determined contributions". (Paris Agreement 2015, art. 6)

More specific considerations regarding mitigation efforts are provided in Decision 1/C.P. 21, part 3, where it is planned to develop a document that would provide guidance for Parties' NDCs, which "ensures" that Parties utilize the IPCC methodologies and common metrics in their GHG emissions reports, and that Parties would "strive to include all categories of anthropogenic emissions or removals in their nationally determined contributions and, once a source, sink or activity is included, continue to include it", providing then an explanation to the reasons of exclusion of any categories.

Article 7 emphasizes the importance of adaptation measures and treats adaptation as a "global challenge faced by all", with special consideration of efforts taken by Non-Annex I Parties, but underlining the major need for mitigation as "greater levels of mitigation can reduce the need for additional adaptation efforts, [since] greater adaptation needs can involve greater adaptation costs"; Parties are then encouraged to utilize the Cancún Adaptation Framework to strengthen cooperation on adaptation measures. (Paris Agreement 2015, art. 7)

Article 8 officially recognizes the importance of loss and damage associated with climate change as a legal principle; articles 9 to 11 present the issues of finance, technology transfer, and capacity building; article 12 very briefly encourages cooperation in "climate change education, training, public awareness, public participation and public access to information". (Paris Agreement 2015, art. 8-12)

An "enhanced transparency framework" system (ETS) is then established, with the goal of "build[ing] mutual trust and to promot[ing] effective implementation"; the framework supposedly mandates each Party to the Agreement to submit transparent and complete information in a Biennial Transparent Report (BTR) that should contain:

a. Their national inventory report of GHG emissions by sources and removals, as well as sinks of GHG using the methodologies compiled by the IPCC and adopted by the Conference of Parties.
b. Information related to the implementation of their NDCs.
c. Information on issues related to climate change adaptation and impact assessments.
d. Information on technology transfer, finance transfer, and capacity-building from Annex I Parties as for provided support, and from Non-Annex I Parties as for requested and needed aid.

All this information will undergo a technical review that is tasked to "identify areas of improvement […] a review of the consistency of the information […] taking into account the flexibility accorded [to Non-Annex I Parties]" (Paris Agreement 2015, art. 13). The ETS will replace the original Transparency Framework of the UNFCCC by 2024 and become the only report and verification mechanism of the whole convention, according to the UNFCCC Secretariat.

Finally, before merely bureaucratic dispositions, such as the nominee of a meeting of the Parties to the Agreement, the choice of a secretariat, rules regarding subsidiary bodies and matters relating to the entry into force, amendments, disputes settlements, and so on (Paris Agreement 2015, art. 15-29), a new system called the "global stocktake" is established. This innovative assessment of the collective progress in meeting the objectives of the Agreement took place for the first time during COP28 in 2023; its goal is to "inform Parties in updating and enhancing […] their actions by the relevant provisions of this Agreement, as well as in enhancing international cooperation for climate action". (Paris Agreement 2015, art. 14)

COP 24 established the roadmap for the implementation of the Paris Agreement, called the Katowice Climate Package. The COP adopted all the decisions taken by the CMA that occurred at the same conference, including mitigation and adaptation measures, and established a High-level ministerial dialogue on climate finance, reiterating the need for increased ambition in national planning. The UNFCCC Secretariat commented already in 2016 that the presented INDCs were insufficient in keeping global temperature increase below 2°C, reiterated the importance of the work and contributions coming from the IPCC, and stressed the importance of the first "facilitative dialogue among Parties" (Talanoa Dialogue) as an adopted transparency mechanism during COP 23 (Decision 1/C.P. 24 2018, art. 1-5). The COP also reiterated the importance of effective reporting using the "modalities, procedures and guidelines for national inventory reports contained in chapter II of the annex to decision 18/CMA.1" to provide proper

technical reviews and allow the transparency mechanism to work properly. (Decision 1/CP. 24 2018, art. 6)

The PA was commonly praised initially as a "major leap for mankind" (The Guardian, 2015), and is, in fact, the "first global accord on climate change that contains policy obligations for all countries" (Dimitrov, 2016), but negotiations were harsh and the clashes between the "developed" countries (and especially the U.S.), and the G77 in language issues: at the end of the negotiations, which were held mainly in secret, a new evolution of the CBDR principle also took place, where the marked differentiation between Annex I and non-Annex I Parties would become less and less incisive, maintaining a division based on "national circumstances" rather than a net separation of countries based on merely economic indexes. (Dimitrov, 2016)

The PA leaves wide space for action to national entities since its ETS and the whole deal rely upon the submission and adoption of NDCs, and on reporting through BTRs, whose content is completely at the discretion of the Party. NDCs are then individual and non-prescriptive proposals that collectively should produce an effort that would limit the global temperature increase to 1.5°C or 2°C at maximum. NDCs have been submitted twice by 2024 by each Party and follow a fixed structure. Despite their initial intentions and objective of more effectively allowing concrete climate action, it is now believed that the collective effort states have put into their NDCs is not enough to maintain global temperatures below the general targets in both 2030 and 2050. In particular, recent calculations found out that if NDCs were fully quantified and adopted, emissions would still increase by 6-13% in 2030 on a 2010 basis, but would then reach a reduction of 32-34% emissions in 2050 on the same year basis (Meinshausen et al., 2022); this would then translate into limiting temperatures just slightly below 2°C, while exceeding the 1.5°C threshold shortly after 2030 (Meinshausen et al., 2022). This means that future NDCs must be more ambitious and should aim at covering additional areas and sectors more effectively, as was repeatedly reported in the UNEP Emissions Gap Report in recent years.

NDCs, and especially the transparency documents that should be submitted as proof of their implementation then open the possibility of accounting domestic military emissions voluntarily by all Parties and with commonly shared methodology (the 2006 IPCC Guidelines): however, as proof to the dependency path following the negotiations and decisions of the Kyoto Protocol, a provision similar to a "national security clause" is inserted in the Katowice Climate Package. In particular, article 47 of the package states that:

> "Each party shall report estimates of emissions and removals for *all categories, gases, and carbon pools* considered in the GHG inventory […] at the most disaggregated level, in

> accordance with the IPCC guidelines […] using the common reporting tables […] except in cases where it may be technically impossible to separate information on emissions and removals, […] and noting that a minimum level of aggregation is needed to protect confidential business and military information" (Decision 18/CMA1, 2018, art. 47)

The Paris Agreement also marked a possible new moment for discussing international military emissions, and in particular the issue of military aviation and marine bunker fuels. The problem of accounting for international bunker fuels still produced intense debate during numerous. COP meetings (Romera, 2016), and a definitive decision in terms of changing the status quo has not been taken yet since the KP. Thus, the PA negotiations also included debates on these emissions, with some drafted proposals with a clear call for their limitation and insertion in low-emission development strategies (UNFCCC, 2015) that would not make it into the final text of the treaty. The drafted propositions also included specific reference to the works of the IMO and ICAO and their cooperation in the settlement of the issue. By the end of the negotiation and with the adoption of the final Paris Agreement text IBFs were excluded from the treaty. In particular, the CMA decided that:

> "Each Party should report international aviation and marine bunker fuel emissions as two separate entries and should not include such emissions in national totals but report them distinctly if disaggregated data are available […]." (CMA 1 2018, art. 53)

Their exemption from national emissions targets occurred for two possible reasons, as recognized by Romera: (i) reductions would not apply to all countries, thus implying a fierce division of obligations by the involved Party and resembling the provisions of the KP, which failed because of their strictly prescriptive nature, and (ii) recognizing that countries where the interests in keeping these emissions exempted would not support quantified emissions limitations. (Romera, 2016)

Overall, the Paris Agreement was a "missed opportunity" for finally deciding on the issue of regulating reporting and accounting of international bunker fuels, but the decision to finally postpone the discussion yet more and not including these fuels in national totals ultimately maintained the status-quo and reproduced the path already taken in the previous twenty years of climate negotiations and governance. The sole inclusion of the ICAO and IMO as the only accepted contributors in developing a methodology for regulating these emissions also remarked that this only officially applies to civilian international bunker fuels, therefore limiting its potential scope by yet again exempting international military emissions. This is especially true after NATO announced in 2021 that it would produce a methodology to count

and report military emissions. The methodology was published in 2023, but NATO has not been officially contacted or included in SBSTA meetings so far, leaving their contribution outside of the institutional framework of the UNFCCC.

In general, the PA had a relatively small impact on the military emissions gap: as the discussion above noted, international bunkers were not a matter in which crucial decisions were adopted, and instead, the choice was to postpone the problem to future COPs and SBSTA encounters: as a matter of fact, the possibility of international bunker fuel emissions being generated by military aviation or navigation was not even discussed, even though this cannot be confirmed as negotiations remain classified. It is not possible to verify if officials from the Pentagon or any other defense institution were directly involved in the definition of negotiating stances in the same way as during the KP negotiations, but given the outcome of the negotiations, it can be stated that the critical juncture that occurred during the Paris Agreement negotiations was that of maintaining the status quo by choosing not to change the current state of things in this particular issue.

The provisions on domestic military emissions reporting and accounting were generally positive but rather unimpactful: change came in the terms that every country is now required to produce NDCs and BTRs adjusted to their national circumstances: these should include some sort of military emissions if the State/Party decides so and formerly leaving the specific accounting of military emissions completely voluntary in nature. This is a slight improvement compared to the KP, with the only difference being that it would not be limited to Annex I Parties. Again, the CBDR norm was not fully internalized at this point as both the reporting guidelines under the Paris Agreement give complete discretion on how to handle responsibilities for GHG emissions derived from military activities.

What the Paris Agreement made possible and enabled in this regard, though, is the enlargement of the space of climate governance to non-state actors by creating the Non-State Actor Zone for Climate Action platform (NAZCA), which offered a space of maneuvering to private entities and allowed them to participate in COPs, also opening the space to advocacy groups, including some NGOs involved in accounting militaries for their emissions. Their contributions would not be included, however, in the decision-making processes happening during the COPs until the first Global Stocktake in 2023. Once again, the issue of the military emissions gap has been left apart and willingly unresolved, perpetuating the path-dependency process that originated after the KP: exemption of international military emissions, and no specific provisions on limitations of domestic military emissions.

3.5 – Climate Initiatives and Policies Adopted after the UNFCCC in the Asia-Pacific

Initiatives in tackling Climate Change in the Asia-Pacific under various ambitions (mitigation, adaptation, capacity building, …) where both Japan and the ROK have played a role have been flourishing after the adoption of the UNFCCC and subsequent treaties.

Japan, the ROK, and China formed a regional organization, the Trilateral Cooperation Secretariat (TCS) in 2011, to formally institutionalize the cooperation that has developed between the three countries since 1999. Within this institution, the Trilateral Environment Ministers Meeting (TEMM) has been a yearly occurrence that has proved successful as a tool for exchanging ideas, enhancing cooperation at both private and public levels, keeping on track the progress, and reaffirming the commitments taken by the three governments on environmental issues, including Climate Change. The outcomes of TEMM meetings took the form of various Tripartite Joint Action Plans (TJAPs), plans of action to tackle diverse issues by cooperating in areas such as environmental education, pollution control, and also including climate change in the vision of accomplishing the objectives of the UNFCCC. (TJAP 2010-2014; TJAP 2015-2019; TJAP 2021-2025)

Initiatives such as the Asia-Pacific Partnership on Clean Development and Climate Change (APP) aimed at cooperating in specific industrial sectors to achieve the "diffusion, deployment, and transfer of existing, emerging and longer-term cost-effective, cleaner, more efficient technologies and practices", as well as achieving a reduction of pollutants while meeting energy needs in the eyes of climate change and harmonizing these objectives to the principles of the UNFCCC such as CBDR (APP Charter 2006, art. 1-2, Annex); this partnership may have had an impact on military emissions as the covered industrial sectors included capital-intensive and therefore GHG-intensive production sites such as steel production industries (APP Work Plan, 2006), which also serve military purposes, and also pushed for the adoption of renewable energies, but no official data is present to assess any potential impact. The initiative was terminated in 2011.

Japan also initiated an East Asia Low Carbon Growth Partnership Dialogue from 2012 to 2015, intending to create a forum for exchanging ideas and practices towards low-carbon growth and was a complementary instrument to the UNFCCC, which was recognized as the main regulatory tool for climate governance. The dialogue covered many areas and also included best practices from different countries to draw from and build capacity on, but military issues were never identified or discussed; national defense organizations were never included

in any of the talks or events as well, proving their historical exclusion from these types of initiatives. (MOFA of Japan, 2015)

Regional cooperation involving Japan and the ROK was also further implemented through ASEAN, with initiatives such as the ASEAN+3 Environment Ministers Meeting in 2003, which led to the adoption of Climate Change Action Agendas between Japan and ASEAN, aimed at strengthening climate change cooperation between Japan and ASEAN based on "three pillars of action", including "transparency, adaptation, and mitigation to enhance co-innovation by using Japanese advanced low/zero carbon and resilient technologies" (ASEAN-Japan Climate Change Action Agenda, 2017; ASEAN-Japan Climate Change Action Agenda 2.0, 2021); the agenda provided cooperation in numerous sectors, both public and private, but never addressed any military emissions issue. A similar framework was adopted between ASEAN and the ROK, with three drafted Plans of Action that included cooperation on climate change-related issues, but never including military ones. (AR-POA 2011-2025)

Bilateral agreements and cooperation initiatives also were implemented: climate cooperation between Japan and the U.S.A. dates back to 2001 with the first meeting under the Bush and Koizumi administrations (U.S.DOS, 2001). Years of cooperation have led to the recent adoption of two more structured plans, the "Climate Partnership on Ambition, Decarbonization, and Clean Energy" of 2021, and the "U.S.-Japan Competitiveness and Resilience (COrE) Partnership" of 2022. Both the initiatives were aimed at cooperating in reaching the 2030 NDCs goals and the 2050 net-zero emissions goal through different projects, including pledges to reduce emissions derived from government initiatives, and to "green" the government made, with efforts in the sectors of zero-emission vehicles and buildings (U.S.DOS Fact Sheet: U.S.-Japan Climate Partnership, 2022); the COrE Partnership also contains initiatives aimed at advancing research and cooperation on the current global crises, including the climate one. Competitiveness and Innovation in selected areas are enhanced through the adoption of several research projects, with the vision of "leading a sustainable, green global economic growth" (MOFA of Japan: U.S.-Japan Competitiveness and Resilience (COrE) Partnership, 2021). Despite their wide coverage of sectors and numerous. projects to be started, no direct reference to any involvement of militaries or defense institutions is presented in any of the initiatives.

Similarly to these two agreements, the ROK and the U.S.A. also signed a Partnership in 2021 that would tackle different global issues, including "climate ambition, sectoral decarbonization, and clean energy development". In particular, the partnership has the common objective of putting common efforts to limit the global temperature increase to a maximum of 1.5°C and

achieve carbon neutrality by 2050. In their joint statement, ROK pledges to publish its 2030 target by COP26; efforts towards achieving net zero emissions in the government is underlined, as well as dispositions on financial flows and public-private cooperation in capital flows redirection towards climate-friendly investments; cooperation between the two countries is also stressed on energy issues, and R&D on alternative fuels and electric vehicles is again stressed (U.S.DOS: Fact Sheet on the United States – Republic of Korea Partnership, 2021). Yet again, no indication that these would apply to military installations or affect the defense sector in any way is presented.

The ROK and Japan also share a record of Climate Cooperation that has taken place mainly under the TCS institutional framework, but starting in 2009, a High-Level Dialogue between Japan and the Republic of Korea on Climate Change was adopted as an initiative to emphasize "cooperation between [the] two countries on global issues including climate change" (Ministry of Environment of Japan); the meetings were held respectively in 2009 and 2010 for a total of five times. No documents or written reports about the details discussed in the meetings are disclosed to the public.

Finally, national climate policies also reflect the progress that states have implemented to reach the goals of the UNFCCC, with a growing number of laws and legal instruments aimed at tackling the issue spreading over sectors. These policies are then communicated to the UNFCCC, therefore allowing assessment and verification processes on their implementation.

In particular, the national Japanese framework for climate policies relies upon the Basic Environmental Act of 1993, which states the basic laws governing environmental issues inside Japan, and the Act on the Promotion of Global Warming Countermeasures of 1998, which "sets the target [and measures] for reducing GHG emissions […] that businesses and citizens [and] the national and local governments should implement in order to achieve the target". (Japan's NC 2022:104)

Japan aims at the objectives of limiting global temperature rise "well below" the 2°C threshold and putting effort into limiting it to a 1.5°C increase maximum, as well as reaching emissions peak as soon as possible. Moreover, Japan pledged to reduce total GHG emissions to zero by 2050, which was inserted as a legislated target in the Amended Global Warming Countermeasures Promotion Act in 2021. Japan's 2030 reduction target of GHG emissions is 46%, based on 2013's emissions, and will be achieved by "promot[ing] as many initiatives as possible in all areas". Finally, Japan will tackle global GHG emissions by "creating markets,

developing human resources, and building systems [that would contribute] to the efforts to reduce global emissions". (Japan's NC 2022:104-106)

Japan's policies comprehensively target the Energy, Industrial, Agriculture, Land-Use-and-Change and Forestry, and Waste sectors. The policies mainly aim at transitioning to renewable energies, local grids, and a general objective of reaching a "Low-Carbon society" by 2050, with the main tools being market mechanisms. Inter-ministerial cooperation is often cited as an important factor within all sectors and stressed over the latest submitted National Communication of 2022. (Japan's NC 2022:3.3.2-3.3.6)

Two more areas of coverage include Cross-cutting measures which include the promotion of urban and regional systems that harmonize economic and environmental benefits, and a section is dedicated to the specific issue of IBFs: this last section covers the issues of international aviation and shipping by adopting measures and policies developed by the ICAO and the IMO to reduce CO2 emissions, such as the promotion of the adoption of Sustainable Aviation Fuels (SAF), introducing more efficient technologies in Air Traffic Control systems (ATC), and the development of climate-sound technologies for aircraft and related equipment. Specific measures for environmentally friendly airports are also included, with the inclusion of medium-long-term strategies for carbon-neutral airport facilities by 2030 and 2050. (Japan's NC 2022:3.3.7-3.3.8)

Japan also has adopted a national Adaptation Plan to pair with actions directed at mitigating GHG emissions: in particular, the Climate Change Adaptation Act and the following National Climate Change Adaptation Plan promoted actions such as impact assessments, the promotion of local and regional adaptation centers that would foster cooperation between government, academia, and civil society to provide local adaptation plans. Finally, international adaptation cooperation is also stressed as a further opportunity to develop adaptation strategies domestically and abroad. (Japan's NC 2022. 5.3-5.7.2)

The ROK also submitted its mitigation policies to the UNFCCC in 2021. The general reduction policy chosen by ROK is based on an Emission Trading System, which follows the guidelines contained in the Act on Allocation and Trading of Greenhouse Gas Emissions Allowances, in turn, inserted into a Master Plan for the Emissions Trading System, which is articulated in three phases. The main objectives of the policies are (i) the promotion of low-carbon industries and climate-friendly investments (ii) the reduction of GHG emissions, and (iii) the achievement of the national GHG emissions reduction target and supporting the global carbon market (ROK's BUR 2021:3.2-3.3.1). More specific sectorial provisions are then

defined in ROK's BUR for the Energy, Industrial, Buildings, Transport, Waste, Public, Agriculture and Fishery, and finally Forest sectors. In particular, the "Public and Other Sectors" area mandates the transformation of public buildings and facilities into environmentally friendly ones, as well as more strict regulations on renewable energy usage at all levels of government; moreover, every new vehicle bought by any government agency at any level that possesses at least 10 vehicles must be low emissions, which might include the minister of national security and therefore the military. (ROK's BUR 2021:3.3.2)

In March 2023, the Republic of Korea submitted its first National Adaptation Communication in a separate document, in line with the provisions of the Paris Agreement, in which the context and efforts toward adaptation to Climate Change are explained in detail by the South Korean government. The document states the current adaptation governance as determined by the Framework Act on Carbon Neutrality and Green Growth for Coping with Climate Crisis of 2022, and a National Climate Change Adaptation Plan (NCCAP). The current NCCAP has the objective of "building a climate-resilient nation together with people" by improving resilience in each part of society, promoting scientific-based adaptation strategies and predictions, enhanced monitoring and verification, and informing the public and relevant stakeholders; in particular, areas of improvement would be those of Adaptation Capacity, Monitoring, Prediction and Evaluation, and finally Promoting Adaptation in Society. (ROK's Adaptation Communication 2023)

This paragraph shows how the climate governance system has been bringing consequences on the different levels of cooperation between countries and in domestic climate policies as well. The above-presented initiatives only represent a small fraction of the entire initiative and policy system that the UNFCCC enabled over the years, but projects that were started by and were directed towards military affairs (for example shared initiatives on developing common reporting methodologies) appear to be non-existent over the years. This is particularly noticeable with countries that share a strong, prosperous military alliance, and share technologies, soil, and infrastructure with other armies on their national territory (Japan/U.S. or ROK/U.S.). This is even more discernable after alliances such as NATO decided to cooperate to finally implement a GHG reporting system and a specific methodology (NATO, 2023). How this development will impact Japan and the ROK's defensive organizations is to be seen in the future, but now more than before, the lack of a similar framework makes the two lag behind other military institutions.

3.6 – Concluding Remarks

Despite recent calls and a growing interest in the issue of the military emissions gap in academia and civil society, military organizations are still somewhat exempted from reporting their emissions the same way other sectors are required to. It has now been more than thirty years since the climate governance regime has officially been enabled, but no impactful change or decisions were adopted to solve the issue within the main governance institution of the UNFCCC, nor from a political point of view (COP Decisions) nor from a technical/methodological stance (SBSTA Decisions). In this chapter, I stressed the importance of three critical junctures, three decisive moments when "agent's choices will affect the outcome of interest" (Capoccia and Kelemen, 2007), and that led to the dependent path of military emissions' reporting exemption. These critical junctures also present moments where the progress on the life-cycle of the CBDR principle could be evaluated, with results showing that it seems like Parties have never fully reached the "internalization" stage.

In short, the adoption of a CBDR principle led to the differentiation of reporting requirements solely based on the socio-economic factors and national circumstances of countries in 1992, without taking into account successive economic development, as well as the heavy militarization process of some Non-Annex I countries. By overlooking the relationship between economic growth, militarization, and carbon emissions (Jorgenson et al., 2023) the differentiation between countries was rarely updated to better reflect current situations, both because of structural and political reasons.

Building on this structural deficiency, the Kyoto Protocol negotiations served as the starting ground for military emissions exemption: in particular, documents that were declassified thanks to the U.S. FOIA show how the Pentagon and in general a share of U.S. politicians, lobbyists, and army officials tried to influence negotiations to achieve a complete exemption of military emissions from national reporting requirements and partially achieved this for international military emissions, while obtaining full autonomy on deciding how and if to count domestic ones. A clause that resembles a national security exemption was then inserted in the final documents of the KP, officially enabling the omission of certain types of emissions to quantify limitations and mandatory reporting. Another accomplishment of the U.S. negotiators (under pressure from the U.S. DOD) was that of relegating the discussions on international emissions to the SBSTA, removing any political value to it and making it merely methodological. This occurrence, combined with the non-participation in the negotiations of other defense institutions rather than the U.S. DOD, made it almost impossible for these organizations to

interact, discuss, adopt, and therefore internalize crucial norms such as a domestic variation of CBDR that would have made militaries at least think about their responsibility in emitting GHGs. On the contrary, the KP negotiations pushed for the emergence, cascade, and internalization of a behavioral pattern that would not require clear and transparent reporting of military emissions, finally allowing them to be exempted from any limitation or discussion.

Finally, the most recent and important climate agreement, the Paris Agreement, represents a new milestone in climate governance and the third critical juncture in the issue of the military emissions gap: by adopting this document, Parties to the UNFCCC decided to abandon the structural division of Annex I and Non-Annex I in reporting requirements by applying the same reporting framework to everyone, as well as the same IPCC Guidelines. This newfound momentum in climate governance was an opportunity for further debate and an eventual reform for both international and domestic issues on military emissions, but the final results were quite underwhelming: the path of exempting international emissions was maintained by not including these in national totals, thus. not applying any quantified reduction that Parties might decide in their NCs to these emissions; reporting of domestic emissions has been made a possibility for every party, but their inclusion in GHG Inventories remains voluntary, and passable of confidentiality clauses due to "national security". Pragmatically speaking, the status quo has been maintained and extended to every member of the UNFCCC. The will of the Parties in reporting military emissions will be verified with the submissions of the first BTRs by the end of 2024.

Hence, This state of affairs has been the result of a dependency path characterized by three critical junctures: (i) the adoption of the UNFCCC and the CBDR principle, (ii) the U.S. intervention during the Kyoto Protocol negotiations, and (iii) the choice of not changing the status quo with the adoption of the Paris Agreement. Paired with the missed opportunities of socialization and norm internalization, and finally coupled with the avoidance of the issue the dependency path has been consequently reinforced, these factors might be then parts of the causes that have led to the lack of climate-oriented cooperative initiatives from military organizations for a long time, not only in the Asia-Pacific region, but also worldwide, both at international, regional, bilateral or even domestic level.

One possible explicative factor is, therefore, the presented analysis on the historical and institutional path of the "military emissions gap", with the three identified critical junctures acting as non-catalysts of cooperative initiatives between defense organizations in fully addressing climate change and its implications; failure in internalizing the CBDR principle,

combined with a systematic and structural exclusion of militaries from climate negotiations and talks that has become the new "norm" have impeded the possibility of starting climate initiatives by these organizations, further strengthening the issue of the military emissions gap, and favoring the internalization process of the shared behavior of not reporting military emissions. A counterfactual analysis might also prove the critical junctures and the path-dependency: more complete, transparent, and comparable inventory reports (hence, those including military emissions) might have led to better policy-making, a more complete understanding of the anthropic impact of human activities on the climate system, and a more equal and functional governance system, both at the international and domestic level.

Consequently, the next chapters will analyze the proofs of this path dependency by exploring the UNFCCC Reporting Guidelines on the main document(s) that compose the Measurement, Reporting, and Verification (MRV) System; in addition to this analysis, the role of the IPCC and the science-policy nexus in producing methodologies and official technical and scientific Guidelines for National Inventory Reports must be addressed, with a particular focus on a rather under-researched body such as the IPCC Technical Support Unit and the Task Force on National Greenhouse Inventories, as they play a crucial role in determining the contents and coverage of each NIR. The analysis of the structure of the IPCC, and especially how the specialized working group on GHG inventory guidelines will also be part of a counterfactual analysis, where it will be demonstrated that if COPs had better addressed military emissions by officially inserting them in the UNFCCC agenda, the science-policy nexus would have behaved differently, hence starting positive-feedback loop process between climate negotiators and scientists that might have brought to a different outcome of increased transparency from military organizations towards their emissions reporting, and more prompt and on-time climate policies.

IV - Reporting and Review Systems under the UNFCC and the military emissions gap

Path-Dependency in the UNFCCC Reporting and Review Systems

4.1 – Introduction

The Reporting and Review systems of Parties undertaking Climate Change obligations under the UNFCCC, the Kyoto Protocol, and the Paris Agreement are divided into a report section and a review section. The system follows the principle of CBDR. Reporting requirements and rules are therefore differentiated between those applicable to Annex I Parties and those applicable to Non-Annex I Parties and are the main tool to assess progress on the achievement of the objective(s) of the convention. In turn, every climate policy and initiative that has produced some kind of effect or impact on GHG emissions, such as the one above, should be incorporated into the data and reports that are to be submitted to the UNFCCC.

To better follow the scope of this thesis, this next section will cover the latest guidelines available for reporting progress and transparency under the provisions' commitments and see for the possible evolution and presence of direct references to emissions derived from military activities.

As the KP and the UNFCCC require the same type of communication, they will be aggregated.

The reporting systems will be analyzed as proof of the dependency path(s) that followed the three identified critical junctures in the previous chapter: the adoption of the UNFCCC, the KP, and the PA. In around thirty years of climate governance, the reporting and review systems were updated by the COPs to better adapt to new scientific discoveries and reflect the progress made by the IPCC, which remained the institutional actor that provided the official and recommended guidelines on GHG Inventory reports. It is expected that eventual provisions on military emissions, and in particular international ones, would be addressed within the discourse of a "national security" or confidentiality clause, thus somehow exempting them from mandatory reporting, according to the discussion that unfolded in the previous chapter.

In this section, the following will be discussed:

- Reporting Guidelines for the GHG Inventories reports by Annex I Parties to the UNFCCC and the Kyoto Protocol.
- Reporting Guidelines for Biennial Transparency Reports (BTRs) by Parties to the Paris Agreement.

- Reporting Guidelines for the National Communications (NCs) by Parties to the UNFCCC and the Kyoto Protocol and Non-Annex I Parties to the UNFCCC.
- Reporting Guidelines for Biennial Update Reports (BURs) by Non-Annex I Parties and Biennial Reports (BRs) by Annex I Parties to the UNFCCC.

4.2 Reporting guidelines for the annual Greenhouse Gas Inventories reports by Annex I Parties to the UNFCCC and the Kyoto Protocol

COP19 in 2013 was the last conference where a comprehensive revision of GHG inventory guidelines was adopted. The guidelines were updated to reflect better the implementation and the harmonization of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

The main objectives of the inventory remain the meeting of commitments under the UNFCCC towards the common goal of achieving transparency in emission quantifications; in turn, this would facilitate both the technical reviews and verifications of both NCs and Inventories to develop decision-making under the UNFCCC better.

Annual GHG inventories follow five defined principles:

- **Transparency**: a clear and effectively explained inventory makes it easier to review it and is considered "fundamental to the success of the process for the communication and consideration of the information"; a transparent report makes use of both CRTs and has a structured NIR.
- **Consistency**: a "consistent" report contains, for each year, all and always at least the same sectors, categories, and gases covered by the Party's other past reports, following the 2006 IPCC GL and the methodologies contained in those.
- **Comparability**: reports should be comparable to those of other Annex I Parties in chosen methodologies during the compilation of the inventories. The use of adopted CRTs is strongly recommended to achieve comparability.
- **Completeness**: an inventory is considered complete when it contains *"at least all sources and sinks, as well as all gases"* contained in the 2006 IPCC GL.
- **Accuracy**: an accurate report is one where estimates of GHG emissions and removals are "systematically neither over nor under true emissions or removals". (Annex to Decision 24/CP.19 2013, art. II.B)

The recommended methodology that should be used in compiling national inventories is contained in the 2006 IPCC GL, but Parties can choose other methodologies given that they are "compatible […] and are well documented and scientifically based. In particular, the general guidance to reports establishes that each Party should at minimum communicate information on CO2, CH4, N2O, PFCs, HFCs, SF6, and NF3 gases, as well as their precursors; the report has to be structured on a gas-by-gas basis and following a sectoral approach, converted to the common metric of CO2 equivalency (CO2 eq.).

For the sake of completeness, additional noting methodology is provided to Parties. This methodology should be used when inventory gaps or data gaps are identified and shall provide an explanation of the reasons these exist. Notation keys comprehend:

- **NO**: this should be used for categories and sources where emissions or sinks of the particular gas are "not occurring".
- **NE**: this notation should be used when activity data may be occurring in a specific sector or category but is "not estimated" for some reason. Additional explanations are required in the NIR and under the CRF tables which should justify either the gap, the exclusion, or any other reason that caused a Party not to declare the emissions. If a category produces less than 0.1% of national GHG emissions, this can be excluded and considered "insignificant".
- **NA**: when an activity takes place in the territory of a Party but does not produce any emissions or does not function as a sink, it can be noted as "non-applicable" and can be left blank in the CRF tables.
- **IE**: Parties may decide, for whatever reason, to "include elsewhere" some emissions, meaning that those are being reported under a different source or category; the Party should then indicate where this particular emission(s) is being reported, and provide explanations to why this decision was taken.
- **C**: Parties can define some emissions as leads for the unwanted disclosure of "confidential" information. (Annex to Decision 24/CP.19 2013, art. G.37)

The GHG inventory submission consists of a National Inventory Report and the Common Reporting Tables. The NIR is a document that contains "detailed and complete information on their inventories" and is the main document that would serve as the lead for the review process; the NIR should then provide a written explanation and breakdown of data included in the report, including a national inventory arrangement, which is a description of all the "institutional, legal and procedural arrangements" that occurred during the preparation of the inventory. The CRTs are part of the standardized format for reporting GHG emissions of Annex I Parties and shall be attached to the NIR; the notation system described above must be used in the CRTs. (Annex to Decision 24/CP.19 2013, art. II.G.2-3)

This version of the Reporting Guidelines contains two articles providing additional information on how to treat international emissions and a specific paragraph on military emissions: in particular, "international aviation and marine bunker fuel emissions should not be included in national totals but should be reported separately" (Annex to Decision 24/CP.19 2013,

art. II.G.34), thus confirming that in 2013, the path originated from the KP critical juncture of exempting international emissions, including military ones, was still being reproduced by the institutions and recommended to Annex I Parties. Right next to this provision, the guidelines continue by stating that "emissions and removals should be reported at the most disaggregated level of each source category, taking into account that a minimum level of aggregation may be required to protect confidential business and military information" (Annex to Decision 24/CP.19 2013, art. II.G.36). This specific article is very similar to a "national security" clause that would exempt militaries from consistently and transparently reporting emissions, allowing for aggregation of military emissions within other categories. The only way to recognize and identify these would then be the correct usage of notation keys to indicate that a certain category of emissions data has been aggregated, specifically indicating where and the reasons for doing so. Again, the path of somehow exempting domestic military emissions that originated during the Kyoto Protocol negotiations was undergone in 2013 and has been until the present time.

The historical and institutional evolution of these two articles then confirms the path-dependency: since the first reporting guidelines for National Inventory Reports that were adopted in 1999, articles 18 and 19 already contained provisions on international bunkers and military emissions. These provisions indicated that "international aviation and marine bunker fuel emissions […] should not be included in national totals but reported separately" (FCCC/CP/1999/7/18), and that "emissions and removals should be reported at the most disaggregated level of each source category, taking into account that a minimum level of aggregation may be required to protect confidential business and military information". (FCCC/CP/1999/7/19)

Two identical articles can be found in the 2002 revision of the same guidelines in articles 24 and 27, adopted during the 2004 SBSTA session (FCCC/SBSTA/2004), proving that the path dependency that followed the U.S. intervention in the KP negotiations was reproduced not only in substance, by copy-pasting these two articles for every GL update, but also in language, by leaving their linguistic content unchanged in over 25 years of constant revision of the reporting and verification system of Annex-I's NIRs.

4.3 Reporting Guidelines for Biennial Transparency Reports by Parties to the Paris Agreement

The Enhanced Transparent Mechanism (ETM) developed under the Paris Agreement consists of a main document called the Biennial Transparency Report (BTR) that needs to be submitted to the Secretariat to track the progress under the Convention and the Agreement and provide a "clear understanding of climate change action […] including clarity and progress towards achieving Parties' individual nationally determined contributions (NDCs), […] adaptation actions, […] to inform the global stocktake". The BTR follows some principles, including the importance of improving reporting and transparency over time, the five principles of transparency, accuracy, completeness, consistency, and comparability, and the principle of flexibility granted to developing country Parties, among others. In particular, an emphasized principle is that of improved reporting and transparency over time, that would "identify, regularly update and include as part of its biennial transparency report information […] areas of improvement".

The report should include, inter alia, a NIR of GHG emissions; information on the progress made in achieving their NDCs; information on climate change impacts and adaptation, and other information regarding technology transfer, capacity building, and financial needs. Adaptation communications can also be reported through the BTR but must be specified and identified (Annex to Decision 18/CMA.1 2018, art. I). BTRs are, in substance, a merge of NCs and NIRs that all Parties must submit following the same guidelines.

In general, a NIR should follow the 2006 IPCC GL, but both the 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands, and the 2019 Refinement to the 2006 IPCC Guidelines are also encouraged to be utilized. The general rules of an NIR mimic the same as those contained in the Annual Greenhouse Gas Inventories Report Guidelines by Annex, I Parties to the UNFCCC but are broadly applied to every Party to the PA and updated by including the voluntary usage of the most recent IPCC Guidelines. The same set of notations are required to be used by Parties for completeness. One of the main differences between the Paris Agreement's NIR and the UNFCCC is the addition of mandatory emissions of NF3, and the inclusion of international aviation and marine bunker fuel emissions to national totals voluntarily. (Annex to Decision 18/CMA.1 2018, art. II)

NIRs consist of a National Inventory Document (NID) and the Common Reporting Tables (CRTs). The NID is the main part of an NIR and consists of a thorough descriptive approach to all the issues related to the compilation of the inventory, starting from the description of the

national circumstances of the Party, proceeding with the description of trends in GHG emissions and removals, and then a detailed portion of text for each sector included in the report, starting from Energy, Industrial Processes and Product Use, Agriculture, LULUCF, Waste management, Other sectors and finally indirect emissions and a final chapter on areas of improvement and recalculations. Annexes to the NID comprehend the identification of Key categories, including additional information on the level of disaggregation of data; information on uncertainty assessment, two quality assurance, and quality control sections, "any additional information, as applicable, including detailed methodological descriptions of sources or sink categories and the national emission balance", and finally the CRTs. (Annex V to Decision 5/CMA.3 2021)

After the NIR, a BTR should follow the structure detailed in Annex IV to Decision 5/CMA.3 of 2021 and proceed by providing detailed information on the progress made by the Party towards implementing and achieving the NDC submitted under the Agreement. This, in practice, states: (i) "Mitigation policies and measures, actions and plans […] related to implementing and achieving a nationally determined contribution", including a national GHG emissions and removals summary and projection, (ii) adaptation strategies, risk, and vulnerability assessments, as well as loss and damage issues related to climate change impacts, (iii) information on financial, technology development/transfer, and capacity-building support *provided and mobilized* under the Agreement, (iv) Information on financial, technology development/transfer, and capacity-building support *needed and received* under the Agreement.

Even further, the BTR should also include specific information that is required to be submitted when BTR and NCs are jointly communicated, information on requested flexibility, *information on areas of improvement related to reporting over time, comprising both those identified by the technical reviews and those identified by Parties* and finally any other information considered relevant to the meeting of the objectives of the Convention and the Agreement.

Annexes to the BTR should comprise technical papers regarding the REDD+ framework, the CRTs of NIRs, and the Common Tabular Formats (CTFs) of the first four categories of policies, measures, and information contained in the above-reported structure of a BTR and detailed in Annex II-III of Decision 5/CMA.3 of 2021; finally, information on cooperative approaches can also be submitted via annex to the BTR. (Annex IV to Decision 5/CMA.3 2021)

The first BTRs should be submitted by December 31st, 2024, by all Parties, and will, after this first submission, substitute NCs, NIRs, BRs, and BURs altogether as it was negotiated

under the Paris Agreement. The ETF will then completely replace the older Verification and Reporting System by 2024 and onwards indefinitely. (UNFCCC Secretariat)

Specific indications regarding international or domestic military emissions are presented in the BTRs guidelines that were adopted during COP26 in 2021, where a clause reiterates that:

> "[the CMA] recalls that […] a minimum level of aggregation is needed to protect confidential business and military information and that in such cases a Party shall provide […] information on methods used to estimate emissions and removals for relevant subcategories [in accordance with the IPCC Guidelines]" (CMA 3 2021, art. 26)

and again, during the same COP, the general outlines of BTRs documents were adopted, and in particular, the CMA decided that IBFs would be inserted into the "Energy" sector as a "non-mandatory provision". (CMA 3 2021, Annex V)

The choice of maintaining the same content and language of the previous Guidelines to National Inventory Reports remains crucial in identifying a path-dependency process: despite the intentions of the PA in making domestic military emissions reporting voluntary, it still conceded a sort of "national security" clause by allowing aggregation due to "confidentiality" to all Parties in their reports. International military emissions, moreover, were yet again exempted by maintaining them "non-mandatory" and therefore potentially completely removed from the radars of reporting requirements without the demand of justification from Parties for their eventual omission, No updates to the BTRs reporting GLs were adopted so far, maintaining the military emissions gap potentially unresolved and completely based on the will of Parties.

4.4 Reporting Guidelines for National Communications (NCs) by Annex I Parties to the UNFCCC & Kyoto Protocol

The general structure of a National Communication is stated in its most recent guidelines that were adopted during COP 25 in 2019. The guidelines assist the Parties in meeting the obligations under Articles 4 and 12 of the UNFCCC and also share the ideals and objectives of serving as tools for assessing the progress and implementation of the Convention, while also helping the COP in further decision-making. (Annex to Decision 6/CP.25 2019, art. 1)

Parties are required to describe their "national circumstances" and how they affect GHG emissions or removals. In general, a party is asked to provide information, for the sake of transparency and comparability, of its government structure, including the role of governmental bodies that participate in climate decision-making, the population, economic, geographical, and climate profile, and a series of explanatory information about the sectors that are mandated accountancy under the UNFCCC reporting system: energy, transportation, industry, waste, agriculture, forest and "other". Explanations in the GHG Inventory section of the NC are required to be "consistent with that provided in the most recent annual inventory submission available […] and any differences should be fully explained"; moreover, the information required in the NC about the GHG Inventory does not have to be complete.

The main part of an NC is then the description of policies and measures "adopted to implement the commitments […] of the convention, which need not have the limitation or reduction of GHG emissions […] as a primary objective". The policies should then have a "most significant" impact on GHG emissions and should be those enforced in the national legislation or through a voluntary agreement that is properly funded under both human and financial resources. Policies reporting should be categorized into defined sectors and the specific gas that is planned to be tackled must be specified in a disaggregated way. In more detail, the report is expected to state: (i) the name of the policy or measure, its type, its status of implementation, the main entities responsible for implementation, and a short description, and (ii) sectors and GHGs affected by the instrument and the estimated impact of the policy or measure.

Estimated projections and effects of policies and measures are requested to be submitted within the NC and should be attached to policies reporting tables. Flexibility is given in the way that Parties may choose between reporting projections in three ways:

1. Projections "with additional measures" are the most complete and they also embed future planned policies or measures.

2. Projections “with measures” refer to those adopted and implemented at the time of reporting.
3. Projections “without measures” can exclude all the policies adopted and implemented and can serve as the “baseline” projections.

Projections shall be consistent with the GHG inventory data of previous years and should cover all the sectors and GHGs present in the national inventory. An estimate of aggregated policies and measures is also requested by calculating the difference between “with measures” projections and the “without measures” baseline chosen by the Party.

Methodologies for projections can be chosen freely by Parties but should follow the principles of transparency and completeness as the Party is required to provide sufficient information and explanation as to why a certain methodology was selected; in particular, each model should comprise information regarding the GHGs and the sectors covered, what kind of model it is and its original purpose, and a SWOT analysis of the model.

Adaptation measures are also required to be communicated through an NC, even though in a less detailed and less emphasized way. Parties are required to report on a set of achievements, ranging from climate modeling, projections, and scenarios to different risk assessments, to the description of national adaptation policies in a medium and long-term approach, with annexed monitoring and implementation information and the expected outcomes of said policies.

The final provisions of the guidelines regard finance, technology transfer, and capacity-building information; R&D in climate change issues, and finally the progress on education, training, and public awareness. (Annex to Decision 6/CP.25 2019, art. VII-X)

A National Communication is then more of a narrative document rather than a technical one: its main purpose is that of assessing the progress in achieving the Convention’s objectives of a Party, putting into words the actions taken towards them. While specific policies are not directly referenced in the guidelines, is required their categorization following defined sectors that are comparable to those of GHG Inventories, potentially including climate policies adopted in the defense sector. It is stated, nonetheless, that emissions projections resulting from policies that may be applied to international aviation or marine navigation “shall, to the extent possible, be reported separately and not included in the national total”, to “ensure consistency with inventory reporting”. Policies that might have an impact on international military emissions are, therefore, yet again kept outside of the reporting requirements and commitments, while policies directed

towards domestic military emissions would either not be reported (by ensuring "consistency" with national inventory reports) or left to the will of the Party.

This 2019 decision then reproduces the dependency path by choosing to maintain the status quo and anchoring NC guidelines to previous NIR ones. This confirms that consistency between reports might be considered more important than consistency and transparency between reports and reality, keeping the military emissions gap off the radars even in this reporting document and reproducing its conception as a mere 20-year-old unresolved "methodological issue" rather than moving it into the political field.

4.5 Reporting Guidelines for National Communications (NCs) by Non-Annex I Parties to the UNFCCC

Non-Annex I Parties must submit their NCs to the UNFCCC secretariat as well. The main purposes of NCs for Non-Annex I Parties are to "assist [them] in meeting their reporting requirements" but mainly as a "policy guidance to the operating entity of the financial mechanism" to meet the financial support needed by developing countries to help them meet the commitments agreed under the UNFCCC (Annex to Decision 17/CP.8 2002, art. I.A). The NC shall then comprise a national GHG inventory by sources and removals by sinks; a "general description" of the chosen policies and measures that form the path of a Non-Annex I Party towards implementing the Convention; any other information deemed relevant to the objectives of the UNFCCC. (Annex to Decision 17/CP.8 2002, art. I.B)

The NC should include a description of the Party's national circumstance regarding its development and the basis on which it will address climate change issues. The content of the national circumstances should be chosen from the same range of topics requested by Annex I Parties.

The NC should also comprise a section dedicated to the national GHG inventory of the Party. The recommended methodologies for the compilation and submission of a national GHG Inventory are the 1996 IPCC Guidelines for National Greenhouse Gas Inventories, but a certain degree of flexibility is given to Non-Annex I Parties to help them harmonize their commitments to better suit their "national circumstances"; nonetheless, the Parties are encouraged to apply the whole IPCC GL as thorough as possible, while also taking into consideration the IPCC Good Practice and Uncertainty Management in National Greenhouse Gas Inventories, while progressively improving the transparency, consistency, comparability, completeness, and accuracy of their communicated data. The NC should also contain a description of the progress towards making inventories and the involved institutions. The Inventory should comprehend calculations for the main three types of GHGs (CO2, CH4, and N2O), which are required to be reported more strictly, while leaving all the other gases with much larger freedom of reporting obligations, giving Parties a lot of discretion in the process of compiling their GHG inventory. Tables are then provided in sample formats that are encouraged to be used by the COP and IPCC for Non-Annex I Parties. (Annex to Decision 17/CP.8 2002, art. III)

The description of the "steps taken or envisaged to implement the Convention" part for Non-Annex I Parties is designed to make the Parties provide information on their adaptation and mitigation measures, taking into note that the effective implementation of those by developing

countries highly depends on the contribution and aid of developed countries. Non-Annex I Parties are then required, in this order, to first describe their adaptation measures to climate change, including the studies on vulnerability, risk assessments, and specific needs related to these concerns. Methodologies are left free choice for the Party, given that they are properly "consistent, transparent and well documented" and considered to "better reflect their national situation". Adaptation communications can also include information on other aspects such as vulnerability assessments, identification of "key vulnerable areas" to climate change, and the description of strategies or national adaptation plans or frameworks. (Annex to Decision 17/CP.8 2002, art. IV.A)

Mitigation policies should be published by addressing "anthropogenic emissions by sources and removals by sinks" of GHGs. The methodology for compiling these is left to the choice of the Party, given the fact that they should be harmonized with the concept of sustainable development while prioritizing mitigation of climate change. The reporting is encouraged to be as complete as possible, "to the extent of their capacities", and should include methodologies, expected scenarios, results, policies and measures descriptions, and finally institutional arrangements. (Annex to Decision 17/CP.8 2002, art. IV.B)

The matters of technology transfer, R&D on climate change, education, training and public awareness, capacity building, and networking are all addressed in a single section which leaves a considerable amount of freedom and flexibility to Non-Annex I Parties in their NCs. (Annex to Decision 17/CP.8 2002, art. V)

Non-Annex I Parties are additionally required to submit, within their NCs, a section dedicated to constraints, gaps, and related financial, technical, and capacity needs, to let the other members of COP, and in particular Annex II countries, a list of projects and a proposal of financing of the same; the projects must be aimed at meeting the objective of the convention, as well as facilitating adaptation, technology transfer, capacity-building and other already mentioned objectives deemed as fundamental for the reaching of the ultimate objective under the UNFCCC.

Since the NC of a Non-Annex I Party comprises a GHG Inventory embedded within the document, guidance to its compilation is presented and includes a provision for international bunker fuels: in the case of these Parties, which comprise the majority of States but with a lower share of global emissions (in 1994), "emissions from international aviation and marine bunker fuels [should be reported] separately [and] not included in the national totals" (FCCC/CP/2002/7/Annex I/19, 2002), mimicking the same approach that Annex I Parties are

encouraged to follow. No direct reference to domestic military emissions is contained in the document but for a general confidentiality clause in terms of a notation key to utilize “for emissions and removals which could lead to the disclosure of confidential information”, not specifying the nature of it. (FCCC/CP/2002/7/Annex I/Note to Table1, 2002)

The guidelines were therefore never updated since their adoption (2002), thus. not effectively revising and implementing the progress made by Non-Annex I countries in the last 20 years, which include economic growth, and of course militarization processes. The militarization of these countries is observable through the SIPRI Reports on military expenditures over time, which show an increasing share of investments in States ascribed to the Non-Annex I category in recent years: more equipment and an increase in military activities and equipment inevitably lead to more emissions, which, as proven by the experiences of different defense institutions, and especially the Pentagon, are usually high and tend to occupy a big share of government-originated GHG emissions.

The military emissions gap is thus also applicable to these sets of countries, and the path-dependency of exempting military emissions is continuously reproduced by not including any domestic clause in reporting GL and by exempting international ones from any possible limitation. The CBDR principle also plays a significant role in this issue, since Non-Annex I Parties are somehow morally “justified” in limiting the scope of their emissions: the adoption of outdated methodologies (the 1996 IPCC GL), combined with lesser requirements and more flexibility that would not be adjusted over time contributed then to the widening of the gap in GHG emissions reporting documents.

4.6 Reporting Guidelines for the Biennial Reports (BRs) by Annex I Parties and Biennial Update Reports (BURs) by Non-Annex I Parties to the UNFCCC

One more set of reporting requirements are those taking the form of Biennial Reports and Biennial Update Reports: these were adopted by COP following the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA). The AWG-LCA's major contribution to climate governance is the identification of a "global goal for substantially reducing global emissions by 2050 and a time frame for a global peaking of greenhouse gas emissions". This led to the adoption of yet another instrument for accounting and reporting the progress made by Parties under the UNFCCC, with the adoption of guidance on the Biennial Reports (BR) that Annex I Parties are required to submit.

BRs are an additional document that has the objective of helping Parties meet their commitments under the Convention, and specifically requires that information on emissions reduction, projected emissions, and financial, technological, and capacity-building issues be communicated in more detail. Biennial Update Reports (BUR) are, nonetheless, the second type of document that Non-Annex I Parties to the UNFCC have to submit to prove their progress in meeting their obligations to the Convention. BURs are designed specifically to help these Parties meet their reporting requirements, to "encourage" the presentation of information following the principles of transparency, consistency, completeness, and accuracy that would help them facilitate the adoption of mitigation actions and the request of financial need to implement them.

Both the documents serve then as a temporal "update" to complement NCs, and especially to assess the progress of Parties in implementing the convention between the time required to compile subsequent NCs. While potentially important for the political development of decisions taken during the COPs, neither documents require nor provide any additional information on the issue of military emissions, practically progressing the path of dependency even within these types of documents.

4.7 Concluding Remarks

This brief chapter proved how the path dependency that originated from the identified critical junctures related to the military emissions gap's historical and institutional process took the form of reporting guidelines from COPs that would not address the issue over the years. The path dependency is visible, more concretely, in some articles that have been repeated both in form and language over the years that resemble a "national security" exempting clause. Rather, the "norm" seems to be that of exempting military emissions and not deeming militaries as "responsible" as other actors in contributing to GHG emissions. The non-insertion of the issue also builds the idea and concept of "gap", as the issue is not mentioned in any of the documents on the compilation of BRs or BURs.

Hence, the military emissions gap has a political connotation that has been deemed as a merely methodological one by delegating it to the discussions within the SBSTA sessions, but it still received at least the political attention necessary to be cited in COPs and their decision, especially those regarding the compilation of NIRs. These reports might seem a merely technical exercise and requirement, but, in the light of the critical approach here adopted, they entail a deep political value and provide "significant implications for international climate negotiations [and] mitigation policies". (Harris and Symons, 2013)

The following chapter will research the role of the IPCC, and especially the science-policy nexus that characterizes the UNFCCC system. What is expected from this analysis is the description of a negative feedback loop that has allowed military emissions to be exempted. This issue then had implications on how the main institution tasked with developing methodologies and scientific guidelines for Party members of the UNFCCC, the IPCC, is structured. In turn, this might have disabled national governments from effectively reporting military emissions and had consequences on how military organizations decided to approach the climate crisis and the mitigation/adaptation strategies they started to draft and adopt. Data from the reports of the governments of Japan and the Republic of Korea will form the case study of this thesis.

V – The role of the IPCC and the Science-Policy Nexus

5.1 – Introduction

As I have described in the previous chapters, the "military emissions gap" has formed over the years, within the political sphere of the framework, due to structural and historical reasons. In particular, the principle of CBDR allowed for different reporting requirements from Parties to the Convention: this differentiation is based on socioeconomic indexes that reflect the state of the world at the time of the signing of the UNFCCC. The division between Parties was scarcely updated and now reflects a rather different picture from the current socio-economic reality, meaning that CBDR has hindered the dynamism that was meant to provide. In addition to this structural deficiency, CBDR has never been truly and completely internalized by the State at different levels, therefore impeding a notion of collective responsibility towards the challenges of climate change to spread and take root within both the global community and national institutions. This, in turn, has allowed some organizations to advocate their opposition to requirements such as emissions limitations, emissions quantification, or transparent emissions reports. The U.S. Department of Defense has played a major role in allowing international military emissions to be exempted from emissions limitations and has normalized the behavior of freely managing domestic ones. Hence, the original KP dispositions on excluding international bunker fuels from obligations of any form and confidentiality clauses on military enterprises were adopted and replicated for over thirty years of climate negotiations, treaties, and guidelines for reporting documents. This state of affairs has endured to these days and put the political sphere in a position where military emissions are still largely underreported and managed in a non-systematic way by Parties, consequentially creating the "military emissions gap".

The next steps in analyzing this gap are those of researching the other institution and organization that compose the global climate governance system and in particular its "Science Interface": the Intergovernmental Panel on Climate Change (IPCC). This international organization has been tasked with compiling the best available literature on climate change, analyzing it, and periodically developing comprehensive reports that assess "the science related to climate change" to "provide governments at all levels with scientific information that they can use to develop climate policies. IPCC reports are also a key input into international climate change negotiations". These reports take the form of either Assessment Reports (ARs) that are then translated for policy relevance in the form of Summary for Policymakers (SPMs) or Synthesis Reports (SYRs). (IPCC 2023)

The IPCC is structured in a Panel composed of 195 national governments that participate in it at various degrees and with a plethora of representatives. The Panel operates by consensus and adopts decisions on budget allocations and work programs, as well as directs and overviews reports, principles, and procedures of the whole organization and the Working Groups (WGs) and Task Forces that operate within it. The Panel also elects the Chair of the IPCC and the members of the Bureau.

The Bureau provides information and updated guidance on the scientific and technical works that are conducted by the three WGs, and its members are elected by the Panel in a way that would reflect a "balanced geographic representation". The Bureau also operates an Executive Committee that is tasked with timely and effectively implementing the IPCC work program as well as checking on the progress, dealing with the issues, and strengthening cooperation and communication between the WGs.

Three Working Groups operationalize the program of the IPCC: Working Group I researches the "Physical Science Basis" of Climate Change, and all that is related to the Earth System or geoscience; Working Group II analyzes Impacts, Adaptation, and Vulnerability issues, and lastly the Working Group III focuses on the Mitigation of Climate Change. Each one of the WGs is also paired with a Technical Support Unit (TSU) to better facilitate their tasks. (IPCC 2023)

The IPCC is also composed of a stand-alone Task Force that is dedicated to the research and development of methodologies for the compilation of National GreenhouseGas Inventories: the Task Force on National GreenhouseGas Inventories (TFI). This Task Force is also paired with a Technical Support Unit (TSU) and operates its own Task Force Bureau (TFB) that has the same functions as that of the IPCC. The stated objectives of the TFI are to "develop and refine an internationally-agreed methodology and software for the calculation and reporting of national GHG emissions and removals" and to "encourage the widespread use of this methodology by countries participating in the IPCC and by signatories of the UNFCCC". (IPCC 2023)

Hence, the IPCC has been described as a "boundary organization" that operates in a dynamic, "open to change", and adaptive way "in different times and places" and at "different levels – cognitive, sociopolitical, and spatial" (Beck and Mahony, 2018), challenging the Epistemic Communities theory and idea of a unidirectional flow of information *from* scientists *to* policymakers.

5.2 – Epistemic Communities at Stake: The nature of the IPCC and its decision-making process

The above paragraph describes what forms the "Science Interface" of the proposed theoretical framework of this thesis: its contributions have been widely influential over the years since the adoption of the UNFCCC, but these publications have reciprocally been heavily influenced by the "policy interface" and its developments as well, given the ultimate political control that the IPCC is subjected to.

Being more of a "boundary organization" rather than an Epistemic Community, the IPCC has to face the dilemma of managing "conflict over the correct position […] between fact and value, description and prescription", ultimately making its work "sociopolitical". The IPCC has partially solved the issue by not being directly interfaced with the COPs, but through the mediation of the SBSTA, which "plays a more responsive, mediatory role [and] allows the IPCC to avoid some of the criticism associated with its challenging position [in the Science-Policy nexus]". (Mahony and Beck, 2018)

In practice, however, the IPCC is mandated to provide "policy-relevant but not policy prescriptive assessment of the science of climate change, including physical, technical and social scientific knowledge" (Robinson, 2004). The relationship that characterizes the science-policy interface within the global climate governance and the decision-making processes that occur in the IPCC has been debated over the years, with various critiques posed to the "truth speaks to power" principle and debates based on the epistemic communities' theory. The phrase "truth speaks to power" describes a positivistic approach of an "unidirectional flow of information from the autonomous scientific community […] through to the political communities", which takes place between the UNFCCC and the IPCC and is also harmonized with Haas' Epistemic Communities theory. While this approach may appear to be suitable for describing the science-policy nexus, as well as representing an idea of "policy-relevant but not policy prescriptive assessment" of climate knowledge, it does not consider the friction that occurs between the concepts and principles of "truth" (usually ascribed to Science) and that of, for example, "justice" (usually ascribed to Politics – ie. the CBDR principle that characterizes the UNFCCC). Robinson stressed that information and publications produced by the IPCC are "neither pure science nor pure policy", as "these procedural instruments represent a place where credibility and legitimacy of information can be enhanced [and where the] science and policy communities [are able] to transfer information, values, and discourses in both directions" (Robinson, 2004).

Hence, the IPCC decision-making process and final publication possess a hybrid nature, given the structure and function of the organization (governments are the main members of the organization and elect the Chair and members of the Bureau). This "dual nature" is then represented well in the form of a "nexus", or rather "the complex set of relations between scientific and political dynamics" (Ruffini, 2018), and the IPCC operates at its border. Scientific expertise is collected, analyzed, compiled, and distributed to different actors to create a "comprehensive summary of what is known about the drivers of climate change, its impacts, and future risks, and how adaptation and mitigation can reduce those risks" (IPCC, 2024). Once the drafts of each WG are prepared, they are first reviewed by experts; once the first review is completed, governments have to comment by circulating the drafts to various ministries and representatives. Finally, the reports and publications have to be approved by the IPCC member countries of the UNFCCC, and this last stage proves the ground where "the hybridization of science and diplomacy takes its full place": in fact, the final approval of any IPCC-produced work takes the form of consensus between the *member governments of the organization*, adopting an "UN-style" approach that results in a "long co-construction operated by scientists and government representatives" (Ruffini, 2018). This process is, then, far from being a streamlined "truth speaks to power" dichotomy that would characterize the interaction between two Epistemic Communities, but rather resembles a state of affairs where "scientific facts issued by the IPCC become diplomatic [and then political] facts", allowing a form of unique "back and forth" dialogue between the two epistemic communities. (Ruffini, 2018)

Whether this process does influence diplomatic and political outcomes or not has been discussed by several scholars over time (Carraro et al., 2014; Berg & Lidskol, 2018; Cointe et al., 2019; Lucas, 2021; Asayama et al., 2023; Hermansen et al., 2023). One critical aspect of the IPCC is that it *does not conduct research on its own nor does it provide recommendations* (IPCC, 2024), and thus limits its role to basically summarizing the best of the existing literature on the topics it covers. It is now clear that the IPCC Plenary, in its choice of work programs, tries to keep the principle of "policy relevance" at the core of its decision-making process. It is not well defined, though, what this principle means; moreover, "different countries have different views on what policy-relevant knowledge is", implying that "what is relevant knowledge for actors engaged in climate governance and climate action may not align with what is policy-relevant – or desirable – for the collective 195 governments that comprise the IPCC" (Hermansen et al., 2023).

Policy relevancy is determined, then, through the entire process that takes place when the Plenary decides, under member government request, to produce an Assessment Report. One of the pivotal moments during this process is that of scoping the contents of the Report, which are routinely discussed in their terminology, messages, contents, and structure and ultimately approved by government representatives. As representatives work in different governmental institutions, "their interventions can be both scientific and political", with topics ranging from "specific scientific and technical debates" to "issues relevant for their domestic and international policies"; during this time, governments "may also seek to *prevent* certain topics from being discussed in the IPCC" (De Pryck, 2022). The issue of "policy relevance" is then discussed during the final approval of the ARs, and especially the SPMs as they form the main tools aimed at assisting and providing policy-makers with the latest scientific knowledge on climate change. The approval of the final documents then becomes a proper "negotiation" round between the scientific and the policy interface, where arguments such as "clarity of message", "scientific accuracy", "balance", "policy relevance" "policy prescriptiveness" and "procedural consistency" are brought up by government representatives to the Lead Authors of the reports, which are requested to address them. This puts a growing "social and political pressure" on the IPCC and its procedures, also making approvals of continuously larger and more complex reports a challenge for the organization. (De Pryck, 2022)

Many authors have proposed reforms of the IPCC to better address the increasing complexity of its processes, with a majority of them suggesting breaking down the working groups into smaller units and giving more emphasis on individual chapters and sub-units of the reports (Victor et al., 2014); other scholars have endorsed reform agendas which may include (a) the return of an even clearer separation between the Policy and Science communities, (b) a simplification of the whole procedure with focus on its communication issues, (c) more cooperation with other institutions that are similarly designed or share parts of the objective of the IPCC but are not integrated within it, or (d) a "break down" of the IPCC in smaller, independent units that closely cooperate with governments, NGOs, or corporations to better track their progress and produce independent and original research without being forced to summarize and compile what has already been published. (Hermansen et al., 2018; Parkinson et al., 2022; Asayama et al., 2023)

Another issue that has been brought up by scholars and that has had an impact on the decision-making process and procedures of the IPCC is the range of expertise involved. In particular, the need for additional contributions and research outside the geoscience field is

stressed, as they would provide a “much greater diversity of disciplinary and epistemic inputs into climate change research and policymaking” (Tuinstra et al., 2019; Lucas, 2021). Studies have found that social scientists only compose around 10% of experts included in WGs, with economists being the most represented within WGII (Impacts and Adaptation) and WGIII (Mitigation). Humanities scholars, as well as political scientists, are usually underrepresented, increasing the risk of “framing […] anthropogenic [emissions as] an environmental problem [only], rather than a social problem, which in turn downplays the normative, cultural and political dimensions of the issue”. (Hulme and Mahony, 2010; Lucas, 2021).

Within this state of affairs, what has been addressed as one of the most compelling and critical issues to solve regarding the issue of the military emissions gap is that of missing methodologies that apply to military emissions and the apparent non-interest by the IPCC in providing and developing these, which is in turn caused by the political development of the issue within the “Policy interface” of the UNFCCC (Parkinson et al., 2022). To tackle the issue, a brief description of the IPCC Task Force on National Greenhouse Gas Inventories (TFI) and its decision-making process that leads to the development and publication of emission reporting methodologies will be conducted.

5.3 – The IPCC Task Force on National Greenhouse Gas Inventories (TFI)

The IPCC TFI was created as a sub-unit of the main WGs in 1998. It undertook the IPCC National Greenhouse Gas Inventories Program (IPCC-NGGIP) and was paired with a Technical Support Unit (TSU) set up at the Institute for Global Environmental Strategies (IGES) in Japan in 1999 to better operationalize its work (IPCC TFI, 2023). The TFI has a stand-alone Bureau that is elected by member governments and conducts its work detached from the other WGs but is still under the control of the Plenary, the Bureau, and the Executive Committee, and is tasked with developing and refining an "internationally-agreed methodology and software for the calculation and reporting of national GHG emissions and removals"; it also "encourages the use of this methodology by countries participating in the IPCC and by signatories of the United Nations Framework Convention on Climate Change (UNFCCC)" (IPCC, 2024).

The main outcomes of the work conducted by the task force have been the periodic publication of the IPCC Guidelines for National Greenhouse Gas Inventories (IPCC GL), first in 1996, then updated in 2006, and lastly refined in 2019. In 2000, a Good Practice Guidance (GPG) was also released to supplement the 1996 GLs, but not subside them. These publications are the results of years of work and involvement of "complex interactions between political interests, scientific claims, and the material world" and are usually seen as "purely technical and apolitical" and "organized around claims of "best practices" (Gifford, 2020). These best practices of accounting GHG emissions can have the "capacity to shape society itself" (Lovell et al., 2010), and ultimately are "an attempt to intervene, to act upon individuals, entities, and processes to transform them and to achieve specific ends" (Miller, 1994). All efforts toward tackling Climate Change are, after all, dependent on the "ability to systematically quantify carbon emissions" (Whittington, 2016), a process that takes place thanks to the existence of the IPCC Guidelines as they are the recommended tool and methodology adopted by the COPs to make the verification systems reliable and operational. This means that these Guidelines are "critical for identifying and adjudicating national-level mitigation efforts.". (Yona et al., 2022)

The following chapters will analyze the works published by the IPCC TFI, scoping the areas of interest of the "military emissions gap", which are mainly the Energy and Industrial chapters of the Guidelines. Following the description and analysis of the above-mentioned publications, a scoping of their content related to any reference to military emissions will be conducted. At the end of the chapter, a discussion of the results will show that the political development of the "military emissions gap" had an impact on the scientific and technical development of accounting methodologies as well, proving the negative feedback loop that has taken place

within the dynamic of the interaction between the two epistemic communities. The main expected result from this analysis is the identification of the military emissions gap within the Guidelines published by the TFI. This also constitutes a form of "boundary work in the cognitive mode" that "becomes boundary work in a more spatial mode, potentially leading to the exclusion of knowledge about certain regions and places [and topics]". (Mahony and Hulme, 2018)

5.4 – Reporting of Military Emissions according to the IPCC Guidelines

Unlike the development of military discourses within the Policy Interface, the IPCC TFI did tackle and include some statements on emissions derived from military activities that have been gradually expanded but remained formally the same from the 1996 GLs to their 2019 Refinements.

The 1996 GLs only cite military aviation as a possible source of emissions that amounts to a small share of total emissions to be considered neglectable (IPCC 1996, Vol. 3 Ch. 1.5.3.5). It is worth noting that the 1996 GLs were drafted first in 1994, well before the Kyoto Protocol, and that according to the IPCC Decision-making process, the insertion of this kind of statement was not casual and had to be agreed upon by both the Scientific community and the national governments (see chapter 5.2 and 5.3). It is not possible to determine whether the categorization of military aviation's emissions as neglectable was inserted due to a technical or scientific lack of knowledge or if interest groups tried to push for this insertion at this moment since no official documents on the negotiation session are publicly available. Moreover, the same justification, that military emissions only reflect a small percentage of total emissions, has been made by Pentagon officials during the negotiations of the KP, as I have described in chapter 3 of this thesis.

The IPCC 2000 GPG shows a sign of change as the authors report some issues specific to military interactions in the Energy and Industrial Processes volumes: that of completeness of reports, as road, water-borne navigation, and aircraft fuel usage for military purposes may encounter confidentiality barriers that do not allow a speedy and accurate estimation of emissions caused by these activities.

Additional details are provided in the water-borne navigation chapter, where the IPCC declares that no "distinct method for calculating military marine emissions" exists, recommending a Tier 1 (simplest) approach for non-military vessels for CO2 estimations, and a Tier 2 (more complex) approach for CH4 and N2O, noting that military operations may be unique and not comparable to civil ones, thus additionally recommending the consultation of military experts (IPCC 2000, Vol. 2 Ch. 2.4.1.1); when dealing with Emission Factors for military ships, N2O and CH4 EFs are not available, making the default values provided by the IPCC where national data are not available (IPCC 2000, Vol. 2 Ch. 2.4.2.2); the collection of activity data in terms of fuel usage from military vessels is another recognized issue, with recommendations varying from utilizing national data on fuel acquisition by the military institutions and/or from fuel suppliers, but confidentiality on these data can be an obstacle;

some solutions provided by the IPCC are to consult the Jane's Military Ships Database, or to compromise by aggregating fuel use with a different source category at the cost of transparency, and to always operate the distinction between fuel consumed for internal or international operations (IPCC 2000, Vol. 2 Ch. 2.4.1.3); finally, reporting military domestic activities and related marine emissions in their own category is considered *good practice* to improve the transparency of GHG inventories. (IPCC 2000, Vol. 2 Ch. 2.4.2)

Similar remarks are made for military aircraft emissions: the Tier 1 approach is suggested as the default methodology, but a more detailed methodology is encouraged as different types of military aircraft utilize different technologies; the usage of default Emission Factors from civil counterparts can also be used as many military vehicles present similar characteristics to their civil counterparts (IPCC 2000, Vol. 2 Ch. 2.5.1.2); activity data from military aircraft can be kept confidential by military institutions and the government, but eventual data on fuel usage should be obtained by fuel suppliers or by estimating it using the duration of operations and the number of aircraft involved; the distinction between domestic and international operations is also recommended as *good practice* (IPCC 2000, Vol. 2 Ch. 2.5.1.3); reporting military aviation in its own category in a report is also *good practice* as it improves the transparency of a report (IPCC 2000, Vol. 2 Ch. 2.5.2); the IPCC also provides some default Emission Factors by categorizing military aircraft in groups, sub-groups, and representative type of aircraft and relative fuel usage in kg/hour or L/hour, referring mainly to the U.S.AF Fleet. (IPCC 2000, Vol. 2 Annex 2.5.A.3)

The instances of military usage of industrial processes or products described in the 2000 GPG are in the chapter dedicated to SF6 emissions from Electrical Equipment and Other Sources: a Tier 3b (most complex) methodology for estimating emissions derived from SF6 requires surveys of the heavy utilizers of the gas, including military installations. It is defined as good practice to "identify and include industrial, military, and small-utility applications if these are believed to contribute substantially to total emissions from this source category". (IPCC 2000, Vol. 3 Ch. 3.5.1)

The 2006 Guidelines further expand these issues by inserting specific sub-chapters dedicated to the Energy and Industrial Processes and Product Usage (IPPU) sectors.

Military emissions are issued in the Energy volume for road transportation, water-borne navigation, and aviation. The structure and contents of these chapters in the 2006 GLs are similar to those already mentioned in the 2000 GPG: confidentiality of data is identified as the

main obstacle to estimations. While road transport is just mentioned as a possibility, water-borne navigation and aviation chapters both present a discussion of military-related emissions.

Military water-borne emissions estimation methodologies are not provided in the 2006 GLs, but Tier 1 methodology is advised. Additionally, a specific methodic approach is suggested due to the "special characteristics" of military operations, given the availability of data, and the consultation of military experts is also advised to fill any gaps. As for the collection of data, compilers are invited to contact military institutions to obtain fuel usage information, while operating the distinction between domestic and international as far as possible; finally, water-borne emissions from multilateral operations under the UN Charter should be reported separately, while reporting any other additional emissions that may occur even in water-borne-related navigation in their specific category (transportation of vehicles, off-road ground support equipment, etc.) (IPCC 2006, Vol. 2 Ch. 3.5.1.4). Again, the IPCC stresses the importance of reporting military water-borne emissions to improve the transparency of reports. (IPCC 2006, Vol. 2 Ch. 3.5.3)

Military aviation is treated similarly to water-borne military navigation, as the same difficulties in estimating emissions arise due to confidentiality. In general, a Tier 1 method is recommended when estimating military aviation emissions: default Emission Factors for civil aircraft can be used for the military due to the similarity of certain planes, but for those that do not have a civilian analog, a higher-tier methodology is encouraged. Following the same criteria as for military vessels, either consultation of an expert, or direct request of data to military institutions can be a viable solution to better help compilers include these types of emissions in inventory reports; the distinction between domestic and multilateral operations should be applied to military aviation's emissions as well, while keeping in consideration that those operations conducted under the UN Charter should be reported separately. Another set of data available to compilers is that of ATCs and the operational time of aircraft involved in military operations. The tables that were provided in the 2000 Good Practice listing fuel efficiency of different types of aircraft are then reported back in the 2006 Guidelines by the IPCC (IPCC 2006, Vol. 2 Ch. 3.6.1.4). It is classified as *good practice* to report military aviation emissions in a clear and specific category to improve the transparency of an inventory. (IPCC 2006, Vol. 2 Ch. 3.6.3)

The IPPU Volume reports in chapter 8.3 information on emissions derived from SF6 and PFCs usage in military applications: in particular, PFCs are believed to be heavily and increasingly used as coolers in electronic devices such as "radar systems, avionics, missile

guidance systems, Electronic Counter Measure (ECM), sonars, amphibious assault vehicles, [Airborne Warning and Control Systems (AWAC) and similar aircraft], lasers, Strategic Defense Initiative (SDI), and stealth aircraft", but also in silencing ships and submarines. As the PFCs operate in closed systems, the main sources of their emissions are the production, maintenance, and final disposal of equipment. SF6 is reportedly used in radar systems and AWAC aircraft, as well as in chemical propulsion systems of naval torpedoes and flare decoys; finally, the production of nuclear fuel also utilizes SF6. Thus., the IPCC provides two tiers of methodology to estimate the consumption of SF6 solely in its usage for AWAC aircraft, leaving a gap for every other usage. In the guidelines, it is also stated that the consumption of SF6 and PFCs "may be significant, but no data on quantities are publicly available", suggesting compilers contact either military institutions or suppliers of such gases to obtain information, possibly adopting a Tier 2 or 3 approach by collecting data on manufacture, maintenance, disposal, and quantities of equipment currently circulating. (IPCC 2006, Vol. 3 Ch. 8.3.2.1)

No other direct references to military-related emissions are present in Volume Four (Agriculture, Forestry and Other Land Use) and Five (Waste) of the 2006 IPCC GLs.

The striking aspect of these findings is that the structure and language that the IPCC adopts while issuing military emissions remains the same between the 2000 GPG and the 2006 GLs and appears to somewhat resemble and reproduce the confidentiality provisions adopted during the KP negotiations and onwards. Even though the IPCC provides possible solutions to implement military emissions in national reports and deems their insertion as good practice, the non-prescriptive nature of the Guidelines does not allow for a compulsory and thorough utilization of these by Parties to the UNFCCC. In addition to this, the CBDR principle also allows Non-Annex I Parties to report their GHG Inventories utilizing the 1996 GLs, where any reference to military emissions is hardly present, while the 2006 version does not provide any specific methodology to, for example, estimating the emissions of military vehicles.

The lack of specific methodologies in the IPCC Guidelines reflects the issues related to how the TFI is structured and operates: like the other WGs, the TFI does not produce research on its own, but scopes, analyzes, and compiles existent literature to produce the GHG Inventory Guidelines. In their study of the TFI decision-making structure and process, Yona et al. find that there is a tendency in the IPCC to "ignore newer information […] as not to over-emphasize newer findings which may be less well-tested" (Yona et al., 2022). This is also the result of a process where the UNFCCC and the SBSTA play a role as initiators as well as stakeholders of guideline development. In theory, the TFI is an independent body, but political influence in its

processes is present as the work program is initiated under the request of both the UNFCCC and the SBSTA, as well as the nominations of authors, co-authors, and experts (Yona et al., 2022). Moreover, as the writing process undergoes several review checks from both authors and member governments of the IPCC Plenary, it can be expected that the TFI produces guidelines in a way that "states a desire to create documents that will be used by UNFCCC Parties" (Yona et al., 2022); similarly to the ARs of the main WGs, the draft GLs that the TFI produces are subject to government comments and approval, which may in turn "lead to IPCC guidelines that may differ from peer-reviewed research" in a move from governments to not be subjected to GHGI methodologies and guidelines that "may increase their nationally reported GHG emissions". (Yona et al., 2022)

The TFI, along with Guidelines and methodologies, also developed Common Reporting Tables that allow Parties to schematically report their emissions utilizing a common format of Excel files. The CRTs have evolved over the years with each GLs publication, and their precision and structure have increased as more complex methodologies were developed by the TFI. Non-Annex I Parties have to utilize the CRTs disposition contained in the 1996 GLs, while Annex I Parties have to adopt those of the 2006 GLs.

The 1996 GL CRTs are divided into a list of sources and sinks of GHGs divided by categories that are grouped into the seven main sectors that compose a GHG Inventory:

- **Energy** (Fuel Combustion Activities (1A), Fugitive Emissions from Fuels (1B)).
- **Industrial Process** (Mineral Products (2A), Chemical Industry (2B), Metal Production (2C), Other Production (2D), Production of Halocarbons and SF6 (2E), Consumption of Halocarbons and SF6 (2F), Other(2G)).
- **Solvent and Other Product Use**(3A-D).
- **Agriculture** (4A-G).
- **Land-Use Change & Forestry** (5A-E).
- **Waste** (6A-D).
- **Other** (7).

The volume also provides a list of fuels by categories, and ends with general instructions on reporting, including dispositions on the scope of the inventory, the definition of standard units, the encouragement in using the totality of the source/sink categories, and the periods of reference. (IPCC 1996, vol. 1)

Chapter Eight of the first volume of the 2006 GL provides the Reporting Guidance and Tables that break down emissions sources into five categories and sub-categories:

- **Energy (1):** Fuel Combustion Activities (**1A**), Fugitive Emissions from Fuels (**1B**), Carbon Dioxide Transport and Storage (1C).
- **Industrial Processes and Product Use (2):** Mineral Industry (2A), Chemical Industry (2B), Metal Industry (2C), Non-Energy Products from Fuels and Solvent Use (2D), Electronics Industry (**2E**), Product uses as Substitutes for Ozone Depleting Substances (2F), Other Product Manufacture and Use (**2G**), Other (2H).
- **Agriculture (3(A-D))**
- **Waste (4(A-E))**
- **Other (5(A-B))**

The chapter also provides notation keys for the completeness of information, which comprise: NE (Not Estimated), IE (Included Elsewhere), C (Confidential), NA (Not Applicable), and NO (Not Occurring) (IPCC 2006, Vol. 1 Ch. 8.2.5). Finally, to better identify industries in the above-mentioned sectors that are categorized, the tables provide a suggested list of the International Standard Industrial Classification of all Economic Activities (ISIC) codes inserted in the different categories and sub-categories that compose a National Inventory Report. (IPCC 2006, Vol. 1 Ch. 8.5)

The following subchapters will guide readers on where to find reports of military emissions according to the IPCC Guidelines for compiling the Common Reporting Tables that are included within National Inventory Reports. These codes will then be utilized to search if and how Japan and the Republic of Korea have reported instances of military emissions over the years, assuming they adopted the IPCC Guidelines in their completeness.

5.4.1 – The 1996 Guidelines

The 1996 Guidelines provide a distinct sector in which to insert and compile emissions related to military activities in the chapter dedicated to the explanation of sectors, categories, and subcategories of sources of GHGs, in the introductive volume. In particular, according to the 1996 Guidelines, countries should use:

- Category code 1.A.5 to report “all remaining emissions from non-specified fuel combustion”, including “emissions from military fuel use”, with subcategories:
- 1.A.5.a to report stationary emissions

- 1.A.5.b to report mobile emissions of “Vehicles and Other Machinery, Marine and Aviation (not included in 1.A.4.c.II (Off-road vehicles and Other Machinery in the Agriculture/Forestry/Fishing subsector) or elsewhere.” (IPCC 1996, Vol. 1 Ch. 1.1)

The absence of military emissions is also noticeable by searching if the International Standard Industrial Classification of All Economic Activities (ISIC) codes specific to the military-industrial complex are included in the reporting tables. The 1996 GLs follow the third revision of the ISIC compendium, published in 1989 by the United Nations Statistics Division (UNSD). The only category that possibly includes a share of military-related emissions apart from the above-mentioned is:

- Category 2D (Other Production), which refers to ISIC Division 15 and 29: ISIC 29 includes “Manufacture of Machinery and Equipment N.E.C.”, with class 2927 referring to “Manufacture of weapons and ammunitions” and 2929 “Manufacture of other special-purpose machinery”, not specifying what “special-purpose” means. (UNSD 1989)

The one reference to military emissions is placed in the third volume, the Reference Manual, where the IPCC states that “military and private aviation are not included [in aircraft emissions] because respectively, it is unlikely that detailed information is available and fuel usage is proportionately very small”; at the same time, the provided methodology “can be used for the estimation of the emissions of military aircraft”. (IPCC 1996, Vol. 3 Ch. 1.5.3.5)

5.4.2 – The 2006 Guidelines

The IPCC 2006 GLs provide some coverage of military issues in the chapter dedicated to the explanation and presentation of sectors, categories, and subcategories of GHG emissions sources (IPCC 2006, Vol. 1 Ch. 8.5), by expanding the 1996 GLs tables and adding more subcategories to better scope and identify military emissions.

In particular, for the Energy sector:

- Category 1.A.3.a.i (International Aviation – International Bunkers) states that “emissions from military aviation can be included as a separate sub-category of international aviation provided that the same definitional distinction is applied, and data are available”.
- Category 1.A.3.d.i (International Water-borne Navigation – International Bunkers) allows the inclusion of military water-borne emissions provided that sufficient data are available, and the distinction is defined.

- Category 1.A.5 contains non-specified emissions from fuel combustion, including those from fuel delivery to militaries both in-country and outside; any fuel delivered and utilized for multilateral operations should be reported separately and excluded from national totals.
- Category 1.A.5.a (Stationary) includes stationary fuel usage from militaries.
- Category 1.A.5.b (Mobile) refers to emissions from mobile combustion of fuels, including military vehicles, either ground, marine, or air; can be broken down into the even more detailed subcategories of 1.5.a.b.i (Aviation Component), 1.A.5.b.ii (Water-borne Component), and 1.A.5.b.iii (Other) to increase transparency and include both fuels delivered to the nation's military or any other foreign military organization operating within the country's borders.
- Category 1.A.5.c (Multilateral Operations) includes all emissions derived from fuel usage in military multilateral operations except those under the aegis of the UN Charter, which should be reported separately.

For the IPPU Sector:

- Category 2.G.2.a (SF6 and PFCs from Other Product Uses – Military Applications) includes AWACS (Airborne Warning and Control System) from military aircraft, where SF6 is used and emitted as an insulating gas.

Direct reference to the military-industrial complex through the correspondence of certain categories using the fourth revision of the ISIC database of 2006 is present in:

- Category 1.A.2.h (Fuel Combustion Activity – Machinery) which includes ISIC 30, where group 304, class 3040 refers to the "Manufacture of military fighting vehicles".
- Category 1.A.2.m (Fuel Combustion Activity – Non-specified Industry) that comprehends ISIC Division 25, group 252, class 2520 "Manufacture of weapons and ammunition". (UNSD 2006)

5.4.3 – The 2019 Refinement

No major changes and no additions directly related to military emissions have been included in the 2019 Refinement to the 2006 Guidelines.

5.4.4 – The IPCC Emission Factor Database (EFDB)

Finally, by searching on the official IPCC Emission Factor Database, which is one of the suggested sources to collect data on Emission Factors suggested by the IPCC and contains data from the IPCC Guidelines, Peer-reviewed journals, Annex I Parties past NIRs, NCs, and BURs.

By searching for military-related Emission Factors in the database, some results are available for certain categories by entering the keyword “military” in the full-text search engine:

- Category 2F6 (IPCC 1996) or 2.G.2.a (IPCC 2006) refers to emissions related to the usage of SF6 in AWACS, as reported in the 2006 IPCC Guidelines.
- Category 6D (IPCC 1996) or 4.C.2 (IPCC 2006) refers to emissions of CO2 from the burning of deployed military waste. The publisher of this data is the Technical Support Unit of the IPCC Task Force on National Greenhouse Gas Inventories (TFI TSU), in cooperation with U.S.EPA. The experiment led to the determination of the composition of CO2 for Wood, Metals, Plastic, Dunnage, and Miscellaneous. Waste burning, specifically used by militaries.
- Category 2F1 (IPCC 1996) or 2.F.1.b (IPCC 2006) refers to emissions of some HFCs used in the air conditioning systems of vehicles, including military ones. Two sets of EFs were calculated by the Australian government with the help of the IPCC and the TFI TSU in the 2019 NIR., with a value for both initial and annual losses of HFCs in these systems.

More data can be retrieved by operating a search based on Guidelines categories in the database, with the following results:

By scoping the research to the 1996 and 2006 Guidelines:

- Category 1.A.5.b (Non-specified, Mobile) refers to an Emission Factor calculated by the Ministry of Defense of the Netherlands for Jet Kerosene, submitted in 2012.

5.5 – Concluding Remarks

This section explored the "Science" interface of the UNFCCC by providing insights into the role of the IPCC and its nature as a "boundary organization". In the first chapters, the objectives and structure of the IPCC have been explained and described, highlighting some of the recognized issues that characterize it: in particular, the decision-making processes and the relationship with member governments results in a critical feature in both the modalities of operation of the organization, as well as its boundaries and external limitations. In particular, the issues of "policy relevance" and the non-prescriptiveness of IPCC publications represent controversial issues that are still debated by scholars and experts, as well as former members of the organization to this day, and provide ground for reform proposals and various. critical assessments. Moreover, the key role played by the IPCC TFI in the climate governance system has been briefly explored, given the limited amount of research that has been conducted on it first-hand. What the first half of this section shows is how the IPCC has come to increasingly operate at the boundary of the Science-Policy nexus while still being subject to political control over its work programs and outputs.

Hence, given the weight that political developments of the UNFCCC have on the work of the IPCC, the issue of military emissions has been analyzed in its "Science" interface: the second half of this thesis' section has then shown how, through the above-described structure, the policy clauses that allowed for the military emissions' reporting exemption have been translated into the "Science" interface by utilizing similar language and not developing and providing specific methodologies for their estimation. Despite feasible solutions that have gradually been implemented by the IPCC in their Guidelines and the existence of specific source categories in CRTs, the non-prescriptive nature of the Guidelines and in general of the IPCC publications, paired with a language that permits exemptions and confidentiality clauses ultimately make the few existing paragraphs on military emissions rather lax and underwhelming compared to the extensive reporting guidance that is provided for most of the other sources of GHG emissions. This is also reflected in the choice of aggregating military emissions to the "Other emissions" category in CRTs and allowing for their inclusion in other sectors through notation keys, ultimately making reports of these even less transparent and comparable.

The following section will cover the selected case studies of Japan and the Republic of Korea and the resulting military emissions gap that is expected to result from the analysis of the respective reporting documents submitted to the UNFCCC by the two countries.

VI – Case Studies – The military emissions gap in Japan and the Republic of Korea

6.1 – Introduction

Finally, this section of the thesis will present the case studies that are analyzed to highlight how much the military emissions gap has perdured for the last twenty or more years of climate governance. Official reports and documents will be presented and discussed, starting from Japan and moving to the Republic of Korea. As stated in the first chapters of this thesis, the two countries represent good case studies because both share a high level of socio-economic progress and well-being and reside in the top 15 global economies; both countries show high levels of military expenditure due to the latest SIPRI report, and increasing budget in the defense sectors; both countries are in the top 10 spenders in militaries globally; both countries are militarily allied with the United States and frequently cooperate with it; as for climate-related features, Japan has been an Annex I country since the signing of the UNFCCC, while the ROK has always been a Non-Annex I country despite its steep increase in socio-economic indexes over the last 25 years. This means that Japan and the ROK have different reporting requirements and follow different methodologies of estimation of their GHG emissions.

The effects of the above-mentioned negative feedback loop derived from the political and epistemological developments inside the UNFCCC are then visible through the documents that will form this case study: National Inventory Reports, National Communications, and Biennial Update Reports.

6.2 – Japan's Military Emissions Gap

This chapter will cover the eventual presence of military and defense discourses in the official reports that the governments of Japan must submit to the UNFCCC, both under the main framework agreement and the Paris Agreement. These include the latest National Communication, the Biennial Report, the National Determined Contribution, and the National Inventory Report. Particular attention will be given to the NC, BR, and the NIR, which should provide a qualitative and quantitative approach to the issue, by discussing the presence of actors in decision-making processes and policies directed at curbing emissions, possibly comprising those that involve the defense sector, and by submitting the data on the emissions from the same.

6.2.1 – Japan's 2022 National Communication and Biennial Report

The government of Japan, being part of Annex I countries, is required to follow the guidelines adopted during COP 25 in 2019 while compiling its national communication. As the general guidelines have been discussed in the third chapter of this thesis, and some of its content as well, in-text research will now be conducted to search for any reference to military involvement in the 2022 NC, which also includes the latest BR.

The administrative organization of Japan in terms of climate change tackling is presented in the NC under the national circumstances chapter, where participation from the Ministry of Defense is present in the Global Warming Prevention HQ, established in 2005, to promote climate change countermeasures, link actions and initiatives in a budget perspective between ministries, and collecting budget plans dedicated to global warming countermeasures from different ministries. In particular, details for budgetary contributions from the following ministries are disclosed: Ministry of Economy, Trade and Industry; Ministry of the Environment; Ministry of Agriculture, Forestry and Fisheries; Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Education, Culture, Sports, Science and Technology; no direct reference to the contribution of the Ministry of Defense is presented, allegedly including it in the "Others" category (Government of Japan 2022, Ch. 1.2)

The general emissions trend in Japan follows a decreasing amount of emissions compared to 1990 levels, with Fuel combustion activities, occupying 94.7% of total emissions, IPPU 4.1%, and Waste 1.2%; within the Fuel combustion activities, Energy industries share 41.9% of emissions, manufacturing industries and constructions 22.4%, transport 17%, and "Other" sectors 13.3% (Government of Japan 2022, Ch. 2.1). Trends in emissions and removals by major sectors and by the main GHGs are then provided, with the only exclusion of category 1.A.5 in the Energy sector; trends for PFCs and SF6 emissions are reported with the inclusion

of category 2.G (Other product manufacture and use), which also refer to military usage of these, showing a steep increase of emissions by +445% in PFCs, and +445% in SF6 (Government of Japan 2022, Ch. 2.2.3).

The NC also presents key category analysis and national arrangement analysis for Japan, but since it refers to FY2020, the newer ones published with the latest NIR, referring to FY2021, will be analyzed instead. Nonetheless, no direct reference of the involvement of the Ministry of Defense, or the Japan Self-Defense Forces (JSDF) in national arrangements on climate change governance is described.

The only described direct involvement of the Ministry of Defense in the 2022 NC is in the Adaptation Communication contained in the NC, where it is stated that to implement the National Climate Change Adaptation Plan, a Climate Change Adaptation Promotion Council has been established with the participation of the Cabinet and "the relevant ministries and agencies", tasked with producing a yearly report on adaptation efforts; the NC states that "the Ministry of Defense has been participating since the second meeting in November 2019", thus partially solving the military gap issue, at least at the administrative level.

6.2.2 – Japan's 2023 National Inventory Report

The latest submission from the Government of Japan to the UNFCCC, in terms of climate obligations, is the National Inventory Report of 2023. Following the guidelines adopted in COP 19, the Government of Japan submitted both a text publication in which it explains the report and the Common Reporting Tables in a separate document.

The National Inventory Arrangements of Japan are described in Chapter One of the NIR, where the role of the Ministry of Environment is determined as the overall responsible actor for the national inventory. A breakdown of the involved parties in the compilation of the report and their roles is then provided:

As Figure 6.1 shows, the Ministry of Defense (MOD) is not directly involved in the compilation of the report. A more detailed table is then provided, including the identity of the "Relevant Organization"; no actor related to the military-industrial complex is included in these (MOE Japan 2023, Ch. 1.4.1). The roles of the "Relevant Ministries/Agencies" include the provision of data such as activity data and emission factors, their confirmation, and a Quality Control of the information contained in the Inventory, with some optional roles such as the response to Expert Review Team (ERT) works. The "Relevant Organizations" have the roles of

preparing and providing activity data and emission factors, confirming those, and responding to ERT when necessary. (Govt. of Japan 2023, Ch. 1.2.1.1)

The NIR also presents the chosen key categories decided by Japan for Fiscal Year 2021. In the list of key categories, the categories referring to military-related emissions in fuel combustion, both stationary and mobile (1.A.5) are not present; some categories that should include military emissions are included in the list, such as 1.A.2, which occupies the #3, #8, #11, and #14 positions in the analysis, and SF6 emissions from the 2.G category, which is reported as a category where the trend-based assessment heavily impacts the determination of its Status. as key category. (Govt. of Japan 2023, Ch. 1.5)

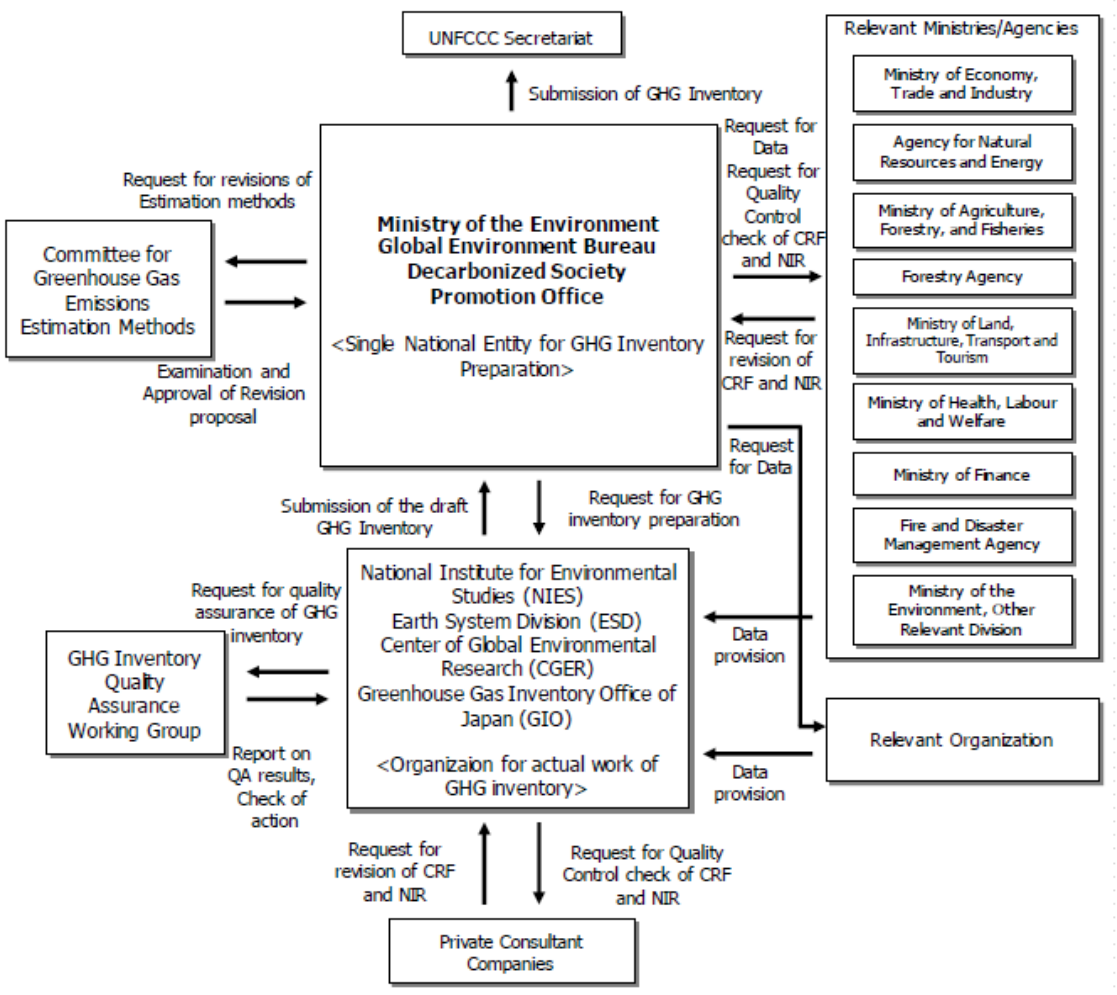

Figure 6.1 Japan's National Inventory Arrangement (Govt. of Japan 2023, Ch. 1.2.1.1)

Chapter three of the NIR illustrates emissions from the Energy sector; in general, these emissions comprise 86.8% of Japan's total GHG emissions, and their trend is decreasing compared to 1990 levels. (Govt. of Japan 2023, Ch. 3.1)

Emissions from the 1.A.2.h and 1.A.2.m categories are not disaggregated, thus leaving a gap for direct attribution of a share of emissions to either the manufacturing of military vehicles and weapons and ammunitions.

As for the explanation of categories related to military emissions, the MOE states that CO2, CH4, and N2O emissions attributable to the 1.A.5 Category, or those "for the national defense purpose" were included in Category 1.A.4.a (commercial/institutional), a category that shares around 6% of total GHG Emissions. The NIR reports that a Tier-2 (sectoral-approach) estimation methodology has been used for CO2 emissions, while a Tier-3 methodology has been utilized for CH4 and N2O; details on the usage of specific emission factors and activity data do not include any reference to military-specific data, provoking a gap in transparency. (Govt. of Japan 2023, Ch. 3.2.10, 3.2.11).

Proceeding to the analysis of the other categories of identified military emissions, in the IPPU sector, category 2.G.2 presents SF6 trend emissions from the AWACS fleet of Japan, calculated using a Tier 2 Method from the year 1999, which is indicated as the moment when "the four-fleet AWACS was officially authorized for use". (Govt. of Japan 2023, Ch. 4.8.2.1) The reported trend is likely unrealistic, as the fleet of AWACS at Japan's disposal has increased after the recent addition to the fleet and additional purchase of new AWAC aircraft from the United States. (Naval News, 2023)

One final reference to military emissions comes from the AFULU Sector, which Japan divides into two categories, one for Agriculture (3), and one for Forestry and Land Use (4); in the latter, emissions derived from "Other Land" (4F) land-use include a "Defense facility Site" subcategory (Govt. of Japan 2023, Ch. 6.9). The NIR redirects readers to the White Book of Japan (The Defense of Japan 2022) for more details on the definition of "Defense Facility Site", but research in the White Book does not come to any result by using the provided keyword.

The reported information can be confirmed by analyzing the CRTs submitted by Japan to the UNFCCC, and the core component of the National Inventory Report. The CRTs presented by Japan are divided by sector and present both a general "Sectoral Report", which aggregates fuel types under the main category identified by the government, and a "Sectoral Background Data", which presents the same categories disaggregated by fuel type.

By looking at the categories related to military emissions provided by the IPCC Guidelines and comparing them to those presented in Japan's CRTs:

2006 IPCC Category	Japan's CRT Category	Reported value(s)	Note / Comment
1.A.3.a.i **(optional inclusion of international military aviation)**	**-**	**-**	The footnote to the category only states that "Domestic aviation and navigation should not include emissions from military aviation and navigation. The emissions from military mobile sources should be reported under category 1.A.5.b."
1.A.3.d.i **(optional inclusion of international military water-borne navigation)**	**-**	**-**	*Ibid.*
1.A.5.a	**1.A.5.a**	**NO**	As the NIR explains, this category is reported under 1.A.4.a, but the CRT seems to report it with the wrong notation key, which should be "IE" (Included Elsewhere). It is also rather unrealistic that stationary military emissions are "not occurring" in Japan, due to the presence of domestic active military bases in the national territory.
1.A.5.b	**1.A.5.b**	**NO**	Same as above, these emissions are included in 1.A.4.a, but the CRT does not use the correct notation key; it is also highly unlikely that mobile military emissions do not occur in Japan, as it would mean that in FY 2021 no activity from military vehicles was observed, even though a massive nation-wide military drill was conducted by the JGSDF and reported by media outlets. (CNN, 2021)
Memo Item – International Bunkers (Aviation)	**Memo Item – International Bunkers (Aviation) (Table 1.S.2)**	**Emissions of CO2, CH4, N2O, NOX, CO, NMVOC**	No disaggregated data is presented, with no differentiation between civil (which can also be reported under 1.A.3.a.i) and military international aviation. A breakdown of the emissions related to the type of fuel is provided in Table 1.D.
Memo Item – International Bunkers (Navigation)	**Memo Item – International Bunkers (Navigation) (Table 1.S.2)**	**Emissions of CO2, CH4, N2O, NOX, CO, NMVOC, SO2**	No disaggregated data is presented, with no differentiation between civil (which can also be reported under 1.A.3.d.i) and military international water-born navigation. A breakdown of the emissions related to the type of fuel is provided in Table 1.D.

Memo Item - Multilateral operations (Also 1.A.5.c)	**Memo Item - -Multilateral operations**	**NO**	Fuel sold to aircraft or vessels engaged in multilateral operations should be reported. Japan declares that emissions from these are "Not Occurring", even though joint international or regional military drills are occurring, and the same Ministry of Defense (MOD) publishes reports on exercises in their periodical pamphlet. The MOD reported twenty-five multilateral exercises in their 2021 publications, and the Japan Maritime Self-Defense Forces reported eighty-seven multilateral drills in 2022. (MOD Japan, 2022). Additionally, the CRT reports, on the Multilateral Operations category, that "Parties may choose to report or not report the activity data and implied emission factors for multilateral operations, consistent with the principle of confidentiality stated in the UNFCCC reporting guidelines. In any case, Parties should report the emissions from multilateral operations, where available, under memo items in the summary tables and in the sectoral report table for energy.", but do not utilize the "C" (Confidential) notation key in the tables for the category.
2.G.2.a	**2.G.2 (Sectoral and Background Data – Tables 2(I)S2, 2(II), 2(II)B-Hs2)**	**Emissions of SF6**	Emissions from the "Other product manufacture and use" of SF6, which include military applications identified by the IPCC are presented in this category.
1.A.2.h	**-**	**-**	The sub-category is not present in the CRT. (It may be included in the 1.A.2.g "other" subcategory, but it cannot be verified).
1.A.2.m	**-**	**-**	The category is not present in the CRT. (It may be included in the 1.A.2.g "other" subcategory, but it cannot be verified).
3.B.6*	**4.F***	**Net CO2 Emissions**	The category includes emissions derived from Land use, Land-Use Change, and Forestry of Defense Facility Sites, but not in a disaggregated way. *The category is specifically addressed by Japan in the NIR as including Defense Facility Sites, where the IPCC does not directly indicate their inclusion.
4.C.2*	**5.C.2***	**Emissions of CO2**	The category includes emissions derived from the Open burning of waste.

			* This category only includes, as explained in Japan's NIR, open burning of industrial waste, which is illegal (MOE of Japan 2023, Ch. 7.4.2); It is therefore not referring to any military-related open burning of waste, but I decided to include it here as the EFDB provides an example of an experiment conducted on the burning of military waste under this sub-category.

Table 6.1 Own elaboration based on data provided by the IPCC and the Government of Japan.

By not providing any more details on military emissions, it remains virtually impossible to determine the exact amount of GHG emissions caused by the MOD and the JSDF, as they are technically included in another sector which does not disaggregate the data. A similar remark can be made regarding the military-industrial complex of Japan, whose inclusion in the report is virtually impossible to verify since it is not clear if the already limited sub-categories provided by the IPCC and referring to it are aggregated in any way to the more general category. To further complicate the issue, it is not justified the reasons why the notation "NO" is used in the proper military emissions reporting categories instead of "IE", as neither the text part nor the CRTs contain any explanation for this choice.

6.3 – The Republic of Korea's Military Emissions Gap

Currently, the ROK is part of the Non-Annex I Parties to the UNFCCC, thus being subject to less prescriptive obligations and fewer reporting requirements. Nonetheless, a *de facto* National Arrangements analysis and a National GHG Inventory are present in both the latest National Communication and the Biennial Update Report. This section will mainly focus on the analysis of the BUR, as it is the most detailed and recent document submitted by the ROK.

6.3.1 – The ROK's 2021 Biennial Update Report

The second chapter of the ROK's BUR of 2021 describes and presents the National Inventory Report. The institution in charge of preparing the document is the Greenhouse Gas Inventory and Research Center (GIR), tasked with "build[ing] and manag[ing] a comprehensive management system of GHG data that includes the volume and factors of national GHG emissions and removal as well as statistics" (MOE of ROK 2021, Ch. 1.5), as well as coordinating all the processes that occur in the compilation of the report. In similarity with Japan's National Inventory Arrangements, the ROK presents a descriptive chart of the main institutions involved in compiling the GHG Inventory: within this, even fewer ministries and actors are involved in the process of development of the report, with the notable absence of the Ministry of National Defense. The composition of the Technical Group is not described, but it is stated that it "consists of external experts from academia and research institutes", while the Working Group is "chaired by the president of GIR and consists of director-level government officials from relevant ministries and organizations per sector" (MOE of ROK 2021, Ch. 2.1.1).

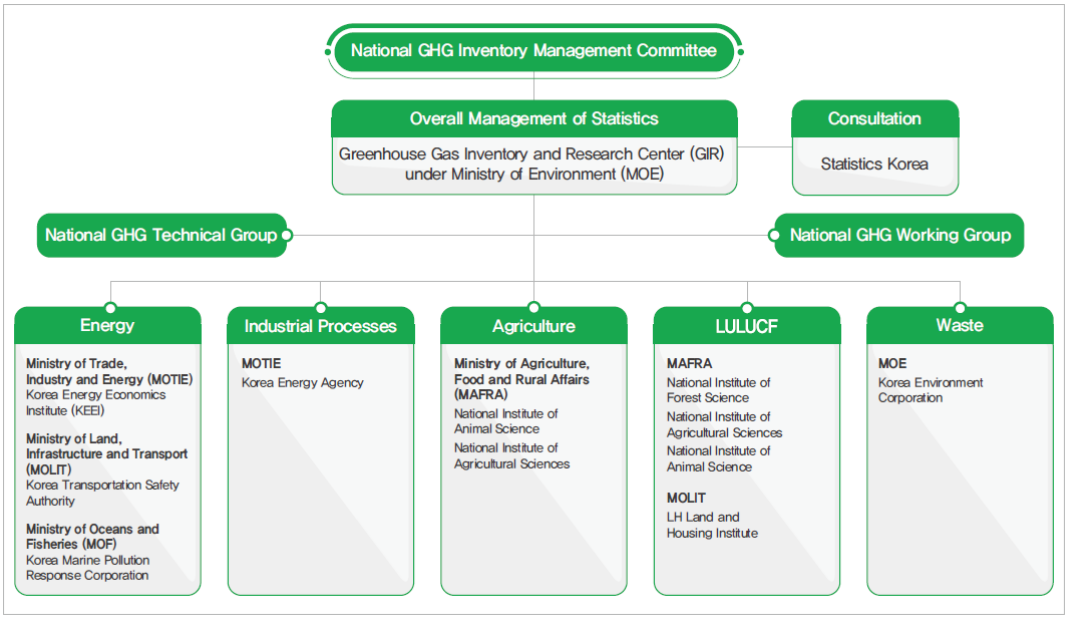

Figure 6.2 ROK's National Inventory Arrangement (MOE of ROK, 2021)

The GHG Inventory follows the 1996 GLs, except for some specific categories, which do not include any of those related to military emissions, where either the 2000 GPG or the 2006 GLs are applied (MOE of ROK 2021, Ch. 2.2.3). Trends of emissions in the ROK are of a general increase over time, in which the biggest component of those derives from the Energy sector (MOE of ROK 2021, Ch. 3). The ROK states that starting 2024 it will apply the 2006 IPCC Guidelines, as required by the UNFCCC and the Paris Agreement, and that they will be applied to "all sectors of the national GHG inventory through additional sectoral activity data and emission factor improvements". (MOE of ROK 2021, Ch. 4.2)

While no additional explanation is given, as the ROK is not subject to submitting any kind of document like the NIR with detailed descriptions of the GHG Inventory, tables reporting the emissions by sectors and categories are provided in the Appendix of the BUR, in which military emissions are reported as follows:

1996 IPCC Category	ROK's 2021 BUR Category	Reported value(s)	Note / Comment
1.A.5	**1.A.5 (Table 1-1)**	**Trends in emissions of CO2, CH4, and N2O**	Aggregated data is reported by the ROK in this category, which includes emissions from military vehicles. No disaggregation based on the division of stationary and mobile emissions is present in the table. The data show a trend of +1616.6% in CO2, +1625% in CH4, and +1618.2% in N2O.
1.A.5.a	**1.A.5.a (Fixed) (Table 1-2)**	**Emissions of CO2, CH4, and N2O in 2018.**	Data on "Fixed" emissions that include stationary military emissions are reported.
1.A.5.b	**1.A.5.b (Movable) (Table 1-2)**	**IE**	The data that should include mobile military emissions is reported as "Included Elsewhere", but no additional information on the aggregation of these emissions to any other category is reported.
Memo Item – International Bunkers (Aviation)	**Memo Item – International Bunkers (Aviation) (Table 1-1)**	**Trends in emissions of CO2, CH4, and N2O**	No disaggregated data is presented, with no differentiation between civil and military international aviation. The trend shows an increase of +150% in CO2, +144% in CH4, and +145% in N2O compared to 1990.
Memo Item – International Bunkers (Navigation)	**Memo Item – International Bunkers (Navigation)**	**Trends in emissions of CO2, CH4, and N2O**	No disaggregated data is presented, with no differentiation between civil and military international aviation. The trend shows an increase of +296% in CO2, +281.4% in CH4, and +281.4% in N2O compared to 1990.

	(Table 1-1)		
Memo Item – International Bunkers (Aviation)	**Memo Item – International Bunkers (Aviation) (Table 1-2)**	**Emissions of CO2, CH4, and N2O in 2018.**	No disaggregated data is presented, with no differentiation between civil and military international aviation for emissions in 2018.
Memo Item – International Bunkers (Navigation)	**Memo Item – International Bunkers (Navigation) (Table 1-2)**	**Emissions of CO2, CH4, and N2O in 2018.**	No disaggregated data is presented, with no differentiation between civil and military international aviation for emissions in 2018.
Memo Item - Multilateral Operations	**Memo Item - Multilateral operations (Table 1-1)**	**C**	All the tables on trends in emissions of CO2, CH4, and N2O derived from multilateral operations use the notation key "C", deeming this information as "Confidential".
Memo Item - Multilateral Operations	**Memo Item - Multilateral operations (Table 1-2)**	**NO**	The 2018 emissions table presents a different notation key when reporting this emissions data, referring to them as "Not Occurring" instead of "Confidential", as reported in the trend tables. At least two conjoined drills were conducted in 2018, which were also reported by media outlets: one in April 2018 (The Diplomat, 2018), and another one in November 2018 (The Guardian, 2018), thus rendering the choice of using notation key "NO" debatable and source of lack of transparency.
2.D	**2.D (Table 1-1)**	**NA or left blank**	Trends in the emissions of CO2, CH4, and N2O from the "Other Industry" category, which includes some military industries, are referred to as "Not Applicable" in CO2 and left blank in CH4 and N2O emissions, thus producing a gap in emissions reporting. The same applies to the emissions of 2018 reported in Table 1-2.

Table 6.2 Own elaboration based on data provided by the IPCC and the Republic of Korea.

6.4 – Other official reporting documents

In conclusion, official documents that express in some way emissions or estimations of them are here presented. The main feature of these documents is that they are not officially submitted to the UNFCCC, and thus are not technically required to follow set methodologies or undergo verification systems. These documents might provide additional insights on the emissions of Japan or the Republic of Korea, potentially including some sources of emissions that are excluded from reports submitted to the UNFCCC to prevent their eventual quantified limitation under the Kyoto Protocol / Paris Agreement. The documents here presented include Japan's 2023 GHG Emission Data document and the ROK's domestic National Inventory Report. The research into these documents is scoped to identify sources of military emissions.

6.4.1 – Japan's 2023 GHG Emission Data document

Within the unsubmitted documents where additional data on emissions can be identified, the Japanese government published a document called "Japan's Emissions data", compiled by the Greenhouse Gas Inventory Office of the National Institute for Environmental Studies (NIES). The document is a summary of various statistics related to emissions of GHG Gases in defined sectors, specifically focusing on CO2, CH4, N2O, and F-gases. The identified sectors in which estimations were made are reportedly the same ones as the "General Energy Statistics", and Global Warming Potentials values utilized are those reported in the IPCC Fourth Assessment Report of 2007.

CO2 emissions categorization does not openly follow the IPCC Guidelines. In particular, emissions from the Energy sector are divided into "Energy Transformation", "Industry", "Transportation" and "Residential"; the remaining emissions are categorized under the more general "Nonenergy related" sector and the IPPU, Waste, and Other subsectors. Acknowledging Japan's choices in compiling the NIR, signs of possible emissions from the defense or military sectors should be searched in the "Commercial Industry" subsector. In fact, within the segments that compose this subsector, the last refers to "Government" and "Unable to Classify" emissions. The aggregated nature of these segments does not provide any clear and tangible proof of military emissions reporting, but since they were inserted in a similar subsector in the NIR, it is assumable that they might have been aggregated within this sector. The trend shows a significant reduction of about 1/3 of "Unable to Classify" emissions, and a parabolic trend on "Government" emissions reaching their peak in 2012 and then gradually lowering from a 1990 basis.

CH4 and N2O emissions follow the IPCC Guidelines, as the categories are numbered utilizing the same organizational system proposed by the IPCC. Here, emissions under 1.A.5 are reported as “Not Occurring”, in line with the data declared in the NIR. Again, since no explanation is given in this document, it is not possible to determine if military emissions of these gases were aggregated in the 1.A.4 category, similar to the NIR.

SF6 emissions derived from military usage are not reported under any of the subcategories identified as sources, unlike the data presented in the NIR.

Two annexes are attached to the main document: the first one is the report of IBFs divided into aviation and marine navigation. No disaggregated data on the share of bunkers between civil and military usage is presented; the second annex presents the sources of CO2 emissions included in the NIR reported to the UNFCCC, where the 1.A.5 and 2.G categories are reportedly omitted. The only note on category 1.A.4, which in the NIR includes all emissions derived from “national defense” activities, is that of the inclusion of “Waste for Energy Purposes”. (NIES, 2023)

6.4.2 – ROK’s 2022 Domestic National Greenhouse Gas Inventory Report

In 2022 the Republic of Korea published a domestic document called “National Greenhouse Gas Inventory Report of Korea” as part of a series that started in 2011. The report mimics and adopts the structure of Annex I Parties’ reports, presenting an introductory chapter, followed by a breakdown analysis of emissions by sources and gases, describing trends from 1990 to 2020. Even though the structure of the document resembles strong similarities to those of Annex I Parties, and the chosen methodology is rather advanced (division in Tier 1-2-3 methods), the adopted IPCC Guidelines generally remain those of 1996 for most sectors, with some exceptions so specific subsectors (ROK 2022, Ch. 1.4). A Key Category Analysis is also conducted adopting both Tier 1 methodology (Absolute Level of Emissions) and Tier 2 (Trend Assessment), identifying nineteen and twenty-one key sources of GHG emissions categorized which contribute to 95% of total estimated emissions in ROK (ROK 2022, Ch. 1.5). The first annex to the NIR also includes other categories that were not identified as “key”, comprising category 1.A.5, which respectively scored the twenty-fourth highest source of emissions and the twenty-sixth major source based on its trend since 1990, scoring an increase of +1606% in CO2 emissions overtime (ROK 2022, Annex 1).

Chapter three of the document presents detailed sector information 1.A.5, including CO2eq emissions derived from subsectors 1.A.5a and 1.A.5b; these include any emissions from “unclassified” sources, including military. The ROK also declares that “fuel consumption for

military purposes, which was previously included as activity data in the "commercial/institutional" sector, was calculated separately as unclassified" (ROK 2022, Ch 3.2.5.1); this means that in the previous versions of this NIR military emissions were aggregated to sector 1.A.4a. The ROK started counting emissions from Sectors 1.A.5(a) starting from 2016 (ROK 2016, Ch. 3.2.5); CO2 emission factors utilized are the same as those utilized in the 1.A.1 sector, while non-CO2 EFs are those used for the 1.A.4a sector, meaning that no specific EFs were adopted for military emissions; moreover, the ROK reports that the activity data were provided by the "Petroleum Oil Supply Statistics" for both domestic and U.S. military services, but that "other military activities were not included in the calculation of emissions […] because they are not officially disclosed as matters related to the national security", thus aggregating those in other sectors, which are not indicated (ROK 2022, Ch. 3.2.5.2). Finally, a statement on the "Improvement" of this reporting category admits that all reported emissions were counted as "stationary" (1.A.5a); the provided reason is that "sufficient information on unclassified activity is not available", then aggregating both stationary and mobile emissions. The ROK states that it will "reconsider" the disaggregation of data "once [they] have more information on the fuel consumed" (ROK 2022, Ch. 3.2.5.6).

Finally, category 2D "Other Industries" is not included in the report as ROK considers them "indirect GHG emitters" (ROK 2022, Ch. 4.1). No additional information or explanation for this exclusion is available in the document, not even in the fourth appendix that assesses the completeness of the report based on excluded sources of emissions.

6.5 – Concluding Remarks

This section provided the case studies selected by the scope of this thesis. From the analysis of the official documents that the governments of Japan and the Republic of Korea submitted to the UNFCCC, the military emissions gap appears widely visible in both countries' GHG reports.

Starting with Japan as an Annex I country, the Japanese government must submit more detailed and complete reports to the UNFCCC Report and Review System, including periodical NCs, NIRs, and BRs/BURs. These documents comprise the integrity of emissions declared by Japan following the Guidelines adopted by COPs and utilizing the recommended IPCC Methodologies.

As shown in this section, the absence of military representation and involvement in Japan's National Inventory Arrangement process is notable due to its apparent exclusion from the compilation of NCs, and most notably NIRs. This absence is, however, unlikely due to the presence of some sort of military emissions declared by the government of Japan, even though these are aggregated to other sources and impossible to discern and clearly identify. Moreover, the latest NC also includes the Ministry of Defense as a participant during governmental meetings on Climate Change issues, not specifying its role in them.

In the 2023 NIR, emissions derived from military activities have been aggregated to other sources due to their confidentiality, but the tables remain rather unclear and untransparent as the compilers decided to utilize the NO (Not Occurring) notation key instead of the IE (Included Elsewhere). Moreover, the level of aggregation makes it impossible to discern between the different sources of emissions and thus makes it difficult to track and count the total share of GHG emissions caused by MOD activities. To further increase the level of ambiguity, some military emissions are identified and declared through CRTs, but it is not clear whether these are to be counted in those already aggregated to other sources or not. The ending result of this management of military emissions inevitably results in an untransparent, incomplete, and incomparable report.

Moving to the second case study presented, the Republic of Korea is subject to lesser and laxer requirements regarding the documents it must submit to the UNFCCC Report and Review System, as it is inserted in the Non-Annex I Party-list. Considering this, the ROK's BUR has been scoped and analyzed as it contains both a form of National Communication and a National Inventory Report with Common Reporting Tables attached to it.

Similarly to Japan, the National Inventory Arrangement does not include, at least formally, the Ministry of National Defense (MND), nor does it explicitly state any direct involvement of its officials or representatives in the compilation of the BUR. In the submitted CRTs, however, some issues of military emissions are declared by the ROK: those derived from stationary sources such as military bases. It is not specified where the government obtained all the data for this estimation from, but it is plausible that the MND was somewhat involved in providing the required information, despite its absence from the described compiling process of the NIR. Again, even though with lesser requirements in comparison to Japan, other sources of military emissions are either deemed confidential, undeclared, or included in other sources. These provisions inevitably make the report less transparent, complete, and comparable as it does not cover *all of the source categories* required by the laxer 1996 IPCC GL. Interestingly enough, the Republic of Korea, as a Non-Annex I, declares these emissions more than Japan, in their own insufficient reporting.

Finally, two domestic documents that report GHG emissions data are presented: in Japan, the 2023 GHG Emissions Data Report states that some emissions related to national security are aggregated to specific sources and categories drafted by the IPCC GL, explicitly declaring what could be military emissions: their tracking, however, is difficult since they are not clearly indicated such, and no additional information on how they were estimated is provided. Moreover, other sources of military emissions such as SF6 usage are not inserted, finally making this document yet another unclear and untransparent data sheet concerning military emissions. In the Republic of Korea, a domestic National Inventory Report has been analyzed since it mimics the structure of those submitted by Annex I Parties to the UNFCCC, and follows the 2006 IPCC GL. This document presents military emissions divided by sources only for stationary emissions, describing the methodology and sources of data utilized to estimate them. Mobile emissions are not included, but the ROK states that they will be reported in due time. It is nonetheless a sign of a trend towards more transparent reporting from the ROK, especially in comparison to the government of Japan. If the domestic NIRs were to be submitted to the UNFCCC, the ROK would find itself in a position where its military emissions would be reported in a more complete, transparent, and comparable way to those of Japan, despite it being a Non-Annex I Country.

In conclusion, the two case studies prove how the military emissions gap is still an issue when it comes to official reporting under the UNFCCC Report and Review System. Both Japan and the Republic of Korea do not report their military emissions in a Transparent, Consistent,

Comparable, Complete, and Accurate way. As these reports serve as the main tool for accounting and tracking global GHG emissions that in turn enable more effective climate action, the existence of this gap may contribute to less impactful policies and, in turn, provides an obstacle to the collective effort towards responding to the harsh consequences of Climate Change and the climate crisis.

VIII – Conclusions

This thesis has tried to analyze and research the issue of the "military emissions gap" by connecting the two spheres that compose the current framework for global climate governance: the roles of the UNFCCC and the IPCC. To do so, a hybrid theoretical framework has been adopted to better adapt the analysis to the different structures and development of the two organizations: for the "policy" sphere, the study was based on a historical institutionalist approach, and complemented by elements of constructivism such as the concepts of norms and identity, as well by some issues of discourse analysis; the "science" interface was based on a structural analysis of the IPCC and its main functions, with a particular focus to the work of the TFI-TSU, and complemented by theories on the identity and role of science/scientist, and finally by minor elements of discourse analysis in selected works from the IPCC. The combination of the two analyses is aimed at proving the existence of a negative feedback loop that has endured for more than thirty years and has contributed to the creation, reproduction, and crystallization of a state of affairs where military emissions have been kept off the radar from reports and accounting institutions, resulting to either their exemption or a lack of effort from the defense sector at the time of recognizing, estimating, declaring and retain accountability for them.

Thus, the first part of the thesis is focused on the historical and institutional development of the UNFCCC, with three identified critical junctures that have had a sensible impact on the issue of the military emissions gap discussed in Chapter Three. The first one is the adoption of the UNFCCC itself, and the start of the global climate governance system: as the Framework Convention was adopted, the concept of Common But Differentiated Responsibilities (CBDR) was also placed as a "philosophical principle" that has shaped the way that Parties to the convention would negotiate and take actions, decisions, and retain responsibilities in future Conference of Parties. In particular, the critical issue here was the differentiation between Parties in the required efforts toward the achievement of the objective of the Convention: the differentiation is profound and has its roots in concepts such as justice and collective responsibility but is also flawed. The division between "Annex I" and "Non-Annex I" Parties was drawn based purely on the socio-economic factors and indexes of that time. It was hardly ever updated to reflect better the current state of affairs and development of many countries. Therefore, it has become more of an obstacle than a facilitator of climate negotiations over the years. Moreover, the norm was never completely internalized by States, making it valid more at the international level, without effectively penetrating States' institutions. This fact heavily

contributed to the idea of freely managing the assignment of responsibility between domestic organizations, where the defense sector has gained the most by utilizing the screens of national security and confidentiality of their emissions data. The argument has also been discussed during the negotiations of the Kyoto Protocol, where it appears that the U.S. DOD played a major role in influencing the talks regarding military emissions, along with partner allies. This resulted in the exclusion of military bunker fuels from national quantifications of GHG emissions, as well as a national security clause for domestic military emissions that has allowed Parties to manage their tracking, estimation, and reporting without any particular obligations. The state of affairs has been reproduced and adopted again with the Paris Agreement, which streamlined reporting requirements for all Parties while making them all voluntary, including those referrable to domestic military emissions. At the same time, international bunker fuels, including military, have been confirmed to be excluded from national totals, once again leaving them outside of emissions limitations targets. The adoption of the UNFCCC with its Kyoto Protocol and Paris Agreement have sparked climate action at many levels, with many initiatives taking part in the Asia-Pacific and involving Japan and the Republic of Korea, as well as many other nations and stakeholders: issues of "greening" the military sector cooperatively have not, however, been recorded in over thirty years of climate initiatives, highlighting how the continuous exclusion of these sectors from climate talks have impacted their willingness to take part in the collective effort towards fighting the consequences of a changing climate.

Chapter four closes the first part of this thesis by analyzing and looking for issues of provisions on military emissions adopted by the various COPs in the Guidelines for the main reporting documents that are required to Parties: the GHG Inventories, National Communications, Biennial Update Report/Biennial Reports under the main treaty and Kyoto Protocol, and finally the Biennial Transparency Reports under the Paris Agreement. All of the analyzed documents present the same clause that makes military emissions either excluded, in the case of international bunkers, or viable of protection due to national security or confidentiality reasons. Even the chosen language and phrase structure has been the same for every update or revision of the Guidelines, thus constantly reproducing the state of affairs and the "military emissions gap" by adopting the same norm over the years.

Moving into the second part of this thesis, Chapter Five analyzes the IPCC and its changing role over the years, focusing on recognized structural issues, such as its critical feature of being government-controlled in its processes: hence, the problem of the relationship between Scientists and Decisionmakers is dealt with by identifying how and at what grade the two

communities influence each other in their work programs. In particular, the focus is placed on the role and structure of the IPCC TFI, the Working Group tasked with developing guidelines and methodologies for GHG Inventory Reports. This Working Group operates within the IPCC but is more independently governed, having its own Bureau that decides on its processes and work program. Despite this formal higher grade of independence, however, recent studies have proved that political control also has a tight grip on the development and publication of more technical guidelines such as those related to GHG Inventories (Yona et al., 2022). The chapter proceeded to scope and research the following documents: the IPCC 1996 GL, the 2000 GPG, the 2006 GL, and the 2019 Refinements. Within these, there are articles and very general information and guidance on how to treat military emissions, but all of these are also paired with specific clauses regarding the confidentiality of military information due to reasons such as national security, reproducing the same content and language utilized during COPs and the UNFCCC Guidelines. It is noticeable, moreover, that the contribution of militaries to global GHG emissions has been acknowledged by the scientific community in the IPCC at the time of the 2000 GPG, and even more when the 2006 GLs were published. Despite this recognition, however, no specific methodologies were developed by the authors chosen by the IPCC, and the few options available to national compilers are often incomplete, redirect to existing methodologies that do not take into consideration the uniqueness of military emissions, or refer to old data and information that do not reflect the technological advances of global militaries, and especially their exponential growth as reported by the annual SIPRI Reports. Regardless, there are identified and suggested ways to report military emissions for national compilers, for example aggregating the data to other sources of emissions, or consulting experts that might help with the compilation process; specific codes for reporting emissions derived from the activities of the defense sectors are also available. These codes are increasingly specific for each publication of the IPCC GLs on National Inventory Reports. They are also present in the Emissions Factors Database that the IPCC made available as an online tool. These are presented and discussed in the last paragraphs of chapter five, closing the section dedicated to the “Science” interface on a lightly positive note.

Chapter six finally presents the case studies of Japan and the Republic of Korea. The analyzed documents are the latest issues of Japan’s National Communication and Biennial Report, National Inventory Report, and Nationally Determined Contribution. The data reported on these documents all confirm the existence of a gap in reporting emissions from militaries: not only this, but they also show the exclusion of the defense sector from the compilation of these reports. The Ministry of Defense of Japan and the Ministry of National Security of the

Republic of Korea are not inserted in the national inventory arrangements of the two countries, indicating that they are not deemed important stakeholders or agents. Their contribution remains then close to null, or at least is not reported as thoroughly as that of other national governmental institutions. It is noticeable, however, in NIRs and CRTs, that a presence of military emissions that are declared by both governments: in particular, Japan aggregates domestic military emissions to commercial/institutional ones, without providing any further indication; the Republic of Korea reports military emissions from stationary sources, but it only does it a form of domestic National Inventory Report that has never been submitted to the UNFCCC despite it being more complete and transparent. The result of the presentation of the case studies in Chapter Six confirms the reproduction of the military emissions gap even to these days and after more than thirty years of climate actions and negotiations.

It is not clear whether the gap will close in the future, given the small but increasing pressure from advocacy groups and academia, and the growing literature that also tackles this problem. The new reporting requirements under the Paris Agreement established the extension of the 2006 IPCC Guidelines to all Parties of the UNFCCC but made emissions reporting voluntary, abandoning the prescriptive nature of the Kyoto Protocol in favor of a more decentralized system. The 2006 GLs include some guidance for managing military emissions but are not developed enough to allow for Complete, Transparent, Consistent, Accurate, and Comparable reporting of them.

What appears in this thesis is that the hypothesized negative-feedback loop has most likely occurred in the last thirty years and more of climate action, following a path where scientists were pressured by policymakers to not deal with the issue, for reasons that include some vague notions of national security confidentiality, or the lack of available data; consequently, scientists did not produce any meaningful specific methodology for estimating military emissions, also fearing that government might oppose any such insertion in the Reporting Guidelines, and thus decide to treat the issue very generally, and utilizing the same language and clauses that were introduced in COP decisions; this absence also meant for policymakers that the issue of accounting, estimating and reporting military emissions was not as important as those of other sources/sectors (if science does not talk about it, it must not be that critical!). This logic has endured over the years and ultimately produced the “Military Emissions Gap” that scholars have started to notice in recent years.

In conclusion, this thesis has tried to shed light on the presented issues by analyzing both the policy and the science interface of the current global governance system of climate change.

While literature is still relatively young, and a literature strain has not yet fully developed, the increasing number of authors dedicating their time and energies to this issue shows a shifting sign of interest in the direction of trying to better understand and eventually propose solutions to solve the "military emissions gap". One of the limits of this thesis, and a possible area of research for interested scholars, is the role of civil society in framing, shaping, and discussing the issue: the Global Stocktake has opened the doors of climate negotiations to civil society and advocacy groups, including the above-mentioned Conflict and Environment Observatory, who participated in the 2023 COP28 in Dubai presenting their contributions. As this thesis focused on more institutionalized actors such as governments, governmental agencies, and international organizations, the role of civil society has not been covered. More areas of research may include the role of military-industrial processes and the efforts from the military-industrial complex to "green" itself through industrial policies. Further research in this direction might help in completing the picture and better reflecting on the issue of the military emissions gap, which may in turn lead to a growth of interest by other groups and possibly the inclusion of diverse disciplines and scholars from other fields to tackle and focus on different aspects of the issue. Hence, as this thesis is just a small fraction of the possible work that can be done on this topic, I would like to call for more scholars to approach the "military emissions gap" and contribute to shaping a multidimensional concept of it.

Appendix I - Future Implications

A1.1 – The Leader's Summit of 2021

In April 2021, the President of the United States Joe Biden called for a multilateral talk on the various issues related to Climate Change: The first "Leaders' Summit on Climate" was held virtually on April 22-23, 2021. Prominent figures from the seventeen "largest economies and greenhouse gas emitters" and representatives of countries that are particularly vulnerable to the impacts of the climate crisis were invited to this important event just before the opening of COP26 in Glasgow. President Biden described The event as "vital to make clear that it is a top U.S. priority to combat the climate crisis at home and abroad". (State Dept. 2021)

Among the different topics discussed by participants, a special session dedicated to "Climate Security" was held at the end of the first day of the meeting: it was hosted by the U.S. Defense Secretary Lloyd Austin, with the head of the CIA and the U.S. Ambassador to the UN as co-chair and moderators. The speakers included NATO Secretary General Stoltenberg and numerous representatives of defense agencies, including the Minister of Defense of Japan at that time, Nobuo Kishi.

First in the line of the speakers was the U.S. Defense Secretary Austin, who shared a completely renewed vision and narrative of what climate change is to the eyes of the Pentagon: the "Climate Crisis", he stated, is an "existential threat, a profoundly destabilizing force". Important remarks have been made on the direct impacts that the Department of Defense (DOD) has faced due to extreme events, such as floods and wildfires that caused "severe damage and disruption to regular operations of the agency", put people in danger, and made more difficult "to carry out the mission of defending the U.S. and its allies" (Austin, 2021). Secretary Austin also declared that President Biden ordered eighteen federal agencies, including the Pentagon, to conduct studies on the security implications of Climate Change; he therefore declared that the DOD pledged to: (i) improve the energy efficiency of all its installations, (ii) deploy clean energy production systems, and (iii) electrify its whole fleet (not specifying what kind of fleet). Austin also recognized the U.K. Ministry Of Defense's climate strategy. He stated that the adoption of such plans would "enhance operations" and create the opportunity "to build infrastructure and lead the green transition, [creating] a more secure, resilient and safer sustainable future". Finally, the Secretary asked for cooperation with partners as "this cannot be done alone" and announced that Climate Change is a "threat multiplier" and that the DOD currently has developed already a "military strategy to Climate Change". (Austin, 2021)

NATO Secretary General Stoltenberg broadened the discourse to the multilateral level, by announcing that "NATO has pushed for a robust climate security agenda", which is articulated in three areas:

1. Understanding Climate Change by improving research and the sharing of data between allies
2. Adapting to Climate Change by conducting risk assessments, prioritizing sustainable technologies in supply chains, and partnering up with industries and the private sector to deliver new "climate neutral capabilities"; in this regard, the need for the inclusion of climate change considerations in planning and exercises was also stressed
3. Mitigating Climate Change: NATO must "play its part in reducing military emissions", as the green transition can offer "win-win" situations, for example by decreasing the dependence on fossil fuels supply chains. To achieve so, Stoltenberg declared that allied militaries are "all standing up to reduce GHG emissions with biofuels, solar panels, and greener military bases", adding that "it makes no sense to have electric vehicles on our streets while our armed forces still rely on fossil fuels."

Finally, Secretary General Stoltenberg concluded his presentation by stating that "NATO must set the gold standard to understand, adapt and mitigate climate change". (Stoltenberg, 2021)

The former UK Secretary of State for Defense also announced the adoption of climate strategies, stating that "sustainability has been embedded in what defense does for a long time", and pledged adaptation efforts and net-zero emissions from the army by 2050 and the choice of a "strategic approach" to climate change. In particular, military organizations should strive and follow the UK leadership to (i) develop adaptation and resilience strategies that are fully autonomous., self-sufficient, and keen in participating in the green energy transition by being "fast followers" of the commercial sector; (ii) drive behavior and systematic change by adopting net-zero build standards, setting carbon targets (the Secretary mistakenly lapsus this as a "carbon taxes") on military organizations and producing mitigation strategies and actions. (Wallace, 2021)

Former Japanese Minister of Defense Nobuo Kishi also intervened in the meeting by stating that the Japanese MOD has been in the process of drafting a plan to reduce GHG emissions which would include the introduction of renewable energies in at least half of the MOD's facilities, and the conversion of current ground vehicles to hybrid electric/diesel prototype engines, developed in cooperation with the U.S.; finally, he declared the creation of a "Climate

Change Task Force" inside the Minister of Defense since "activities for national defense and environmental considerations can go hand in hand". (Kishi, 2021)

Finally, the session dedicated to the encounter of various defense representatives ended with Secretary Austin's declaration that "[this] critical conversation is just the first among many". (Austin, 2021)

Overall, the "Climate Security" session of the 2021 Leaders' Summit on Climate Change proved to be the first-ever attempt to bring together Defense representatives from different countries and share ideas and considerations on Climate Change. It is, in full, a first attempt at the "socialization" process of sharing norms and ideas. It also marked an effort to shape a common vision of the future steps for climate change decision-making in the defense sectors. The U.S. Government itself has described the meeting as "the first-ever U.S. Secretary of Defense convening of Secretaries of Defense focused on climate change" (State Dept., 2021). Despite the statement of being "the first among many", however, President Biden has not called for another meeting yet, thus making the one of 2021 a unicum so far, even after the climatic breakdowns of recent years and the publication of the Sixth Assessment Report of the IPCC with the latest scientific discoveries and the advancement of such knowledge on climate change to unprecedented levels of completeness. In addition, no discussions were held on common reporting systems, increased transparency, or accountability. Some remarks on the concept of "responsibility" ascribable to the issue of collective responsibility were made, but they remained general and pointed to no concrete action to improve reporting systems. As stated earlier in this thesis, until the militaries keep their emissions data classified, unclear, aggregated, or directly unreported, it is not possible to quantify their efforts or evaluate the pledges they make.

The Leaders Summit on Climate represents then a new opportunity for military organizations around the world to finally include some sort of climate norms notions in their multilateral talks. As the meeting proved, militaries finally started to integrate the notions of adaptation and mitigation in their discourses, as well as their interpretation within a "security" discourse. This is not new in the "climate-security/conflict nexus" discourse, which has been discussed internally and by scholars around the world previously already (Levy, 1995; Campbell, 2001; Barnett, 2003; Busby, 2007; Scheffran et al., 2012; McDonald, 2013; Burrows and Kinney, 2016; Crawford, 2022; Augsten et al., 2022). What marks a sign of change is the socialization process that was enabled by deciding to share norms, ideas, knowledge, strategies, and opinions on these concepts with allies within a multilateral forum, which to note, was external to the

official UNFCCC institutional ground. In these regards, it is observable that, during the Climate Security session of the Leaders' Summit, concepts of climate discourse have been proposed by some "norm entrepreneurs", in this case, the U.S., the U.K., and NATO. These actors' speeches were aimed at creating a new discursive space within the defense sectors of the participants, publicly stating their intentions, plans, and ideas on how to frame and respond to Climate Change on diverse fronts. The Leaders' Summit acts as the institutional framework and background allowing the Climate Discourse to "cascade" and ignite the socialization process between a set of potential followers, with the ultimate goal of making them internalize the discourse and adopt new policies, laws or strategies that reflect this internalization.

So far, it appears that the Leaders' Summit is succeeding in this, as more militaries are adopting climate strategies that are planned and developed based on those drafted by the U.S. DOD and the U.K. MOD. The next chapter will present these and briefly discuss them in light of their content, with a particular focus on those eventually adopted by Japan and the ROK.

A1.2 – The Surge of Military Climate Strategies

The Leaders' Summit on Climate Change had a visible impact on how some military organizations started to approach the climate crisis: after the meeting, an increasing number of countries' MODs started publicizing strategies on climate change issues under different names: moreover, all of the countries whose defense representatives participated in the climate security session have published such a document, including the UK (March 2021), NATO (June 2021), the U.S. (September 2021), Japan (August 2022), Spain (2023). Defense institutions whose representatives did not participate in the session also published documents referrable to as "climate strategies", such as Australia, France, or Italy, potentially paving the way for a newfound effort from defense organizations to combat the climate crisis along their civil counterparts.

In August 2022, Japan's Ministry of Defense published the "Ministry of Defense Response Strategy on Climate Change", a document that closely resembles the various climate strategies adopted by the U.S. DOD, Army, Navy, and Air Force, as well as the U.K. MOD one. The main objectives of this strategy are those of generally "adapt and respond appropriately" to the impacts of climate change, but specifically to reach carbon neutrality by 2050 in the long-term, and "reduce total greenhouse gas emitted by the Ministry of Defense and the SDF by 50% by from the FY2013 level by FY2030". "Defense equipment" is, however, excluded from this target. The paper also presents a risk assessment at the global, regional, and national scale, utilizing language and concepts similar to those presented during the Leaders' Summit, such as defining Climate Change as a "threat multiplier". (Japan MOD, 2022)

The basic policy adopted by the MOD includes concepts also highlighted during Stoltenberg's speech at the 2021 Leaders' Summit, including the consideration of "impact by and resilience to Climate Change when formulating All Plans, […] [and the] promotion of Adaptation and Response to Climate Change based on scientific findings". Moreover, a vision towards reaching carbon neutrality by 2050 is presented, including potential limitations and obstacles, such as the issue of the life-cycle of defense equipment. Specific measures mainly include adaptation efforts such as the renovation of military bases, facilities, and infrastructures to better face the adverse impacts of a changing climate; energy supply is another area where specific policies are adopted, in particular towards the "energy shift" needed to achieve a decarbonized society, stressing the need for cooperation between the MOD, the Ministry of Environment, and stakeholders involved in R&D of hybrid systems. Cooperation with the U.S. in researching specific hybrid systems for combat units is highlighted; Security cooperation is

planned to be reinforced both through cooperation in Disaster Response Capabilities, as well as "geopolitical risks associated with future energy shifts". Mitigation measures are placed almost at the end of the specific measures list, and these include improvements in "efficiency and [reduction of] greenhouse gas emissions from Ministry of Defense and Self-Defense Forces facilities", with the inclusion of very general provisions on both stationary and mobile sources of emissions. (Japan MOD, 2022)

Despite these intentions, though, it is not possible (at the moment) to quantify, verify or evaluate the proposed initiatives, since there are no data available on the actual emissions that are produced by MOD activities at all scales. The sole existence of this document, however, marks a step in the right direction for the defense sector of Japan after years of silence and inaction: the hope is that the levels of ambition would increase over time, as well as the transparency and completeness of such reports and/or plans. The Leaders' Summit of 2021 might have sparked climate action by defense sectors, but its effects are yet to be seen, and it is still too early to describe it either a failure or a success. Many defense institutions around the world have started to implement climate strategies (and the Republic of Korea is still, apparently, missing on this), but given their mid to long-term objectives, the efforts from this sector are expected to produce the first results from the year 2030 onwards.

Bibliography

Primary sources

UNFCCC Documents

Decision 212 of the 45th General Assembly of the United Nations, *Protection of global climate for the present and future generations of mankind*, 1990

United Nations Framework Convention on Climate Change, 1992

Decision 1 of the Third Conference of Parties to the UNFCCC [1/CP.3], *Adoption of the Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 1997

Addendum I to the third Conference of Parties to the UNFCCC [Add.I/CP.3], 1997, available at https://unfccc.int/documents/1304

Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1998

Decision 3 of the 5th Conference of Parties to the UNFCCC [3/CP.5], *Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories*, 1998

Addendum I to the 11th session of the Subsidiary Body for Scientific and Technological Advice [FCCC/SBSTA/1999/I/8.4], "*Methodological Issues Emissions Resulting From Fuel Used For International Transportation. Draft Report: Methods Used To Collect Data And To Estimate And Report Emissions From International Bunker Fuels and Continuing Work Under Ddecision2/CP.3 and The IPCC Special Report on Aviation and The Global Atmosphere*", 1999, available at https://unfccc.int/resource/docs/1999/sbsta/misc08.htm

Decision 7 of the 5th Conference of Parties to the UNFCCC [FCCC/CP/1999/7], "*Review of the implementation of commitments and of other provisions of the Convention. UNFCCC guidelines on reporting and review*", 1999

Annex to Decision 17 of the 8th Conference of Parties to the UNFCCC [Annex I/17/CP.8], "*Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention*", 2002

Note by the secretariat at the 18th Session of the Subsidiary Body for Scientific and Technological Advice [FCCC/SBSTA/2003/INF.3], "*Methodological Issues Emissions*

Resulting from Fuel Used in International Aviation and Maritime Transportation", 2003, available at https://unfccc.int/resource/docs/2003/sbsta/inf03.pdf

Decision 8 of the 21st Session of the Subsidiary Body for Scientific and Technological Advice [Decision 8/SBSTA.21], "*Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories"*, 2004

Decision 1 of the 17th Conference of Parties to the UNFCCC [1/CP.17], "*Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action*", 2011

Annex to Decision 24 at the 19th Conference of Parties to the UNFCCC [Annex I/CP.19], "*Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories"*, 2013

Paris Agreement to the United Nations Framework Convention on Climate Change, 2015

Draft of the Paris Agreement to the United Nations Framework Convention on Climate Change, 2015, available at https://unfccc.int/files/bodies/awg/application/pdf/draft_paris_agreement_5dec15.pdf

Decision 1 of the 24th Conference of Parties to the UNFCCC [1/CP.24], "*Preparations for the implementation of the Paris Agreement and the first session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement*", 2018

Decision 18 of the 1st Conference of Parties to the Paris Agreement [18/CMA.1], "*Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement*", 2018

Annex to Decision 18 of the 1st Conference of Parties to the Paris Agreement [Annex I/18/CMA.1], "*Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement*", 2018

Annex to Decision 6 of the 25th Conference of Parties to the UNFCCC [Annex/6/CP.25], "*Revision of the UNFCCC reporting guidelines on national communications for Parties included in Annex I to the Convention*", 2019

Annexes to Decision 5 of the 3rd Conference of Parties to the Paris Agreement [Annex/5/CMA.3], 2021

Decision 12 of the 59th session of the Subsidiary Body for Scientific and Technological Advice, [FCCC/SBSTA/2023/12], "*Methodological issues under the Convention*", 2023

U.S. Documents on the Kyoto Protocol

Council on Environmental Quality (1997), "*Climate Treaty--National Security Exemption"*, The Clinton Library, available at https://nsarchive.gwu.edu/document/27358-document-5-background-paper-council-environmental-quality-subject-climate-treaty [Classification Unknown]

Hambley, Mark G. [U.S. Delegation at Kyoto (USDEL/Kyoto)] (1997), "*Third Conference of the Parties to the Climate Convention, Update No. 3: Report on the Meetings/Activities for Dec 1/2*", U.S. Department of State, available at https://nsarchive.gwu.edu/document/27363-document-10-memorandum-mark-g-hambley-usdelkyoto-subject-third-conference-parties [Classification Unknown]

Sperling, Eugene B. et al. [to President Clinton] (1997), "*Kyoto--Negotiating Guidance*", The Clinton Library, available at https://nsarchive.gwu.edu/document/27359-document-6-memorandum-eugene-b-sperling-et-al-president-clinton-subject-kyoto [Classification Unknown]

Hambley, Mark G. [USDEL/Kyoto] (1997), "*Third Conference of the Parties to the Climate Convention, Update No. 6: Report on Activities/Meetings on December 4/5*", U.S. Department of State, available at https://nsarchive.gwu.edu/document/27363-document-10-memorandum-mark-g-hambley-usdelkyoto-subject-third-conference-parties [classification Unknown]

Saile, Sharon [Environmental Protection Agency] (1997), "*COW/QELROs Negotiations, Friday December 5, Morning Session, 10pm-1pm*", U.S. Department of State, available at https://nsarchive.gwu.edu/document/27364-document-11-notes-sharon-saile-environmental-protection-agency-subject-cowqelros [Classification Unknown]

U.S. State Department (1997), "*Climate Change: Outcomes from the Kyoto Conference*", U.S. State Department, available at https://nsarchive.gwu.edu/document/27369-document-16-cable-state-department-state-237825-all-diplomatic-posts-subject-climate [Confidential]

State Department, Office of Science and Technology Policy, Environment Division (1997), "*Commonly Asked Questions about the Kyoto Protocol on Climate Change*" [Draft], The Clinton Library, available at https://nsarchive.gwu.edu/document/27370-document-17-

background-paper-state-department-office-science-and-technology-policy [Classification Unknown]

State Department (1998), "*The Kyoto Protocol on Climate Change*", U.S. State Department, available at https://nsarchive.gwu.edu/document/27371-document-18-fact-sheet-state-department-subject-kyoto-protocol-climate-change [Not Classified]

Gilman, Benjamin A. et al. [to President Clinton] (1998), "*Concerns over U.S. Kyoto Protocol Commitments*", The Clinton Library, available at https://nsarchive.gwu.edu/document/27372-document-19-letter-us-congress-rep-benjamin-gilman-et-al-president-clinton-subject [Classification Unknown]

White House Office of Environmental Initiatives (1998), "*Climate Change Questions*", The Clinton Library, available at https://nsarchive.gwu.edu/document/27373-document-20-talking-points-white-house-office-environmental-initiatives-subject [Classification Unknown]

State Department Bureau of Oceans and International Environmental and Scientific Affairs, Office of Global Change (1998), "*Q's & A's for Climate Change Testimony 2/98*", The Clinton Library, available at https://nsarchive.gwu.edu/document/27375-document-22-talking-points-state-department-bureau-oceans-and-international [Classification Unknown]

Steinberg, James. B. et al. [to President Clinton] (1998), "*Climate Change/Military*", The Clinton Library, available at https://nsarchive.gwu.edu/document/27376-document-23-memorandum-white-house-james-b-steinberg-et-al-president-clinton-subject [Classification Unknown]

White House Office of Environmental Initiatives (1998), "*Climate Treaty and National Security*", The Clinton Library, available at https://nsarchive.gwu.edu/document/27377-document-24-background-paper-white-house-office-environmental-initiatives-subject [Classification Unknown]

Stern, Todd [to President Clinton] (1998), "*Climate Change Weekly Report*", The Clinton Library, available at https://nsarchive.gwu.edu/document/27379-document-26-memorandum-white-house-todd-stern-president-clinton-subject-climate [Classification Unknown]

Partnerships and joint climate initiatives

Japan MOE, ROK MOE, and PRC MOE, *Tripartite Joint Action Plan* 2010-2014, available at https://www.env.go.jp/earth/coop/temm/archive/pdf/actionplan_E12.pdf

Japan MOE, ROK MOE, and PRC MOE, *Tripartite Joint Action Plan* 2015-2019, available at https://www.env.go.jp/content/900523299.pdf

Japan MOE, ROK MOE, and PRC MOE, *Tripartite Joint Action Plan* 2021-2025, available at https://www.env.go.jp/content/900518242.pdf

Charter of the Asia-Pacific Partnership on Clean Development and Climate, 2006, https://web.archive.org/web/20090920021825/http://www.asiapacificpartnership.org/pdf/resources/charter.pdf

Work Plan of the Asia-Pacific Partnership on Clean Development and Climate, 2006 https://web.archive.org/web/20090920021836/http://www.asiapacificpartnership.org/pdf/resources/workplan.pdf

East Asia Low Carbon Growth Partnership Dialogue, 2015 https://www.mofa.go.jp/policy/environment/warm/cop/ealcgpd_1204/index.html

ASEAN-Japan Climate Change Action Agenda, 2017, available at https://www.env.go.jp/content/900512472.pdf

ASEAN-Japan Climate Change Action Agenda 2.0, 2021, available at https://www.mofa.go.jp/files/100252719.pdf

U.S. Archive of the Department of State (2001), *High Level Consultations on Climate Change*, 2001, available at https://2001-2009.state.gov/g/oes/climate/c22936.html

Minister of Foreign Affairs of Japan (2021), *U.S.-Japan Competitiveness and Resilience (COrE) Partnership*

The White House (2022), *Fact Sheet: U.S.-Japan Climate Partnership*

The White House (2022), *Fact Sheet: The U.S.-Japan Competitiveness and Resilience (COrE) Partnership*

The White House (2021), *Fact Sheet: United States-Republic of Korea Partnership*

Minister of Foreign Affairs of Japan, *日・韓環境政策対話*, (lit. Dialogue between Japan and the Republic of Korea on Measures on Environmental Policy), available at https://www.env.go.jp/earth/coop/coop/dialogue/japan_korea.html

Parties' submissions to the UNFCCC

The Government of the Republic of Korea (2021), "*Fourth Biennial Update Report of the Republic of Korea under the United Nations Framework Convention on Climate Change*"

The Government of Japan (2021), *Updated Nationally Determined Contribution*, available at https://unfccc.int/sites/default/files/NDC/2022-06/JAPAN_FIRST%20NDC%20%28UPDATED%20SUBMISSION%29.pdf

The Government of Japan (2022), "*Japan's Eighth National Communication under the United Nations Framework Convention on Climate Change*"

The Government of the Republic of Korea (2023), "*The Republic of Korea's Adaptation Communication. A Report to the United Nations Framework Convention on Climate Change*"

Greenhouse Gas Inventory Office of Japan and Ministry of the Environment, Japan [eds.] (2023), "*National Greenhouse Gas Inventory Report of JAPAN 2023*", Center for Global Environmental Research, Earth System Division, National Institute for Environmental Studies

Greenhouse Gas Inventory Office of Japan, National Institute for Environmental Studies (2023), "*Common Reporting Format (CRF) 2023*"

IPCC Documents

IPCC (1997), "*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*"

IPCC (2000), "*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*"

IPCC (2006), "*2006 IPCC Guidelines for National Greenhouse Gas Inventories*"

IPCC (2019), "*2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*"

Other primary sources

Republic of Korea (2022), - *National Greenhouse Gas Inventory Report of Korea*"

NATO (2023), "*The NATO Greenhouse Gases Emission Mapping and Analytical Methodology*"

United Nations Environment Program (2023), "*Emissions Gap Report 2023*"

Japan Ministry of Defense (2022), "*Ministry of Defense Response Strategy on Climate Change*"

Data sources

Emissions Database for Global Atmospheric Research (EDGAR) (2023), "GHG emissions of all world countries", https://edgar.jrc.ec.europa.eu/report_2023

SIPRI Military Expenditure Database, available at milex.sipri.org/sipri

Greenhouse Gas Inventory Office of Japan, National Institute for Environmental Studies (2023), "*The GHG Emissions Data of Japan (1990-2022)*"

Secondary literature

Asayama, Shinichiro, K. De Pryck, S. Beck et al. (2023), "Three institutional pathways to envision the future of the IPCC", *Nature Climate Change*, 13, 877–880

Beck, Silke, and M. Mahony (2018), "The IPCC and the new map of science and politics", *Wiley Interdisciplinary Reviews: Climate Change*, 9:6, e547

Belcher, Oliver, P. Bigger, B. Neimark, C. Kennelly (2019), "Hidden carbon cost of the "everywhere war": Logistics, geopolitical ecology, and the carbon boot-print of the US military", *Transactions of the Institute of British Geographers*, 45:1, 65-80

Berenson, Douglas (1997), "Pentagon officials consider asking for waiver for U.S. forces: DOD Officials warn Climate Change Treaty could harm Military Readiness", *Inside the Pentagon*, 41:1; 10-13

Berg, Monica, and R. Lidskog (2018), "Pathways to deliberative capacity: the role of the IPCC", *Climatic Change*, 148:1, 11-24

Capoccia, Giovanni and R. D. Kelemen (2007), "The Study of Critical Junctures. Theory, Narrative, and Counterfactuals in Historical Institutionalism", *World Politics*, 59, 341-369

Carraro, Carlo et al. (2015), "The IPCC at a crossroads: Opportunities for reform", *Science,* 350:6256, 34-35

Clark, Brett, A.K. Jorgenson, J. Kentor (2010) "Militarization and energy consumption: A test of treadmill of destruction theory in comparative perspective", *International Journal of Sociology*, 40:2, 23-43

Cointe, Béatrice, C. Cassen, A. Nadaï (2019), "Organising policy-relevant knowledge for climate action: integrated assessment modelling, the IPCC, and the emergence of a collective expertise on socioeconomic emission scenarios", *Science & Technology Studies*

Crawford, Neta C. (2019), "Pentagon fuel use, climate change, and the costs of war"

Crawford, Neta C. (2022), "The Pentagon, Climate Change and War. Charting the Rise and Fall of U.S. Military Emissions", The MIT Press

Depledge, Duncan (2023), "Low-carbon warfare: climate change, net zero and military operations", *International Affairs*, 99:2, 667-685

Dimitrov, Radoslav S. (2016), "The Paris Agreement on Climate Change: Behind Closed Doors", *Global Environmental Politics*, 16:3

Fairclough, Norman L. (1985), "Critical and descriptive goals in discourse analysis", *Journal of pragmatics*, 9:6, 739-763

Finnemore, Martha and K. Sikkink (1998), "International norm dynamics and political change" *International organization*, 52:4, 887-917

Gifford, Lauren (2020) "You can't value what you can't measure: a critical look at forest carbon accounting", *Climatic Change*, 161:2, 291-306

Gould, Kenneth A. (2007), "The ecological costs of militarization", *Peace Review*, 19:3, 331-334

Haas, Peter M. (1992), "Introduction: epistemic communities and international policy coordination", *International organization*, 46:1, 1-35

Hall, Bradford J. (1988), "Norms, action, and alignment: A discursive perspective*", Research on Language and Social Interaction*, 22:1–4, 23–44

Harris, Paul G. and J. Symons (2013), "Norm Conflict in Climate Governance: Greenhouse Gas Accounting and the Problem of Consumption", *Global Environmental Politics*, 13:1, 9-29

Harris, Paul G., and J. Symons (2013), “Norm conflict in climate governance: greenhouse gas accounting and the problem of consumption”, *Global Environmental Politics*, 13:1, 9-29

Hermansen, Erlend A., E.L. Boasson and Glen P. Peters (2023) “Climate action post-Paris: how can the IPCC stay relevant?”, *npj Climate Action*, 2:1, 30

Hormio, Säde (2023), “Collective responsibility for climate change”, *WIREs Climate Change*, 14:4, e830

Hulme, Mike and M. Mahony (2010), “Climate change: What do we know about the IPCC?”, *Progress in Physical Geography*, 34:5, 705-718

Jasanoff, Sheila (1998) “The fifth branch: science advisers as policymakers”, *Harvard University Press*

Jorgenson, Andrew K., B. Clark and J. Kentor (2010), “Militarization and the environment: a panel study of carbon dioxide emissions and the ecological footprints of nations, 1970–2000” *Global Environmental Politics*, 10:1, 7-29

Jorgenson, Andrew K., B. Clark, J. E. Givens (2012), “The Environmental Impacts of Militarization in Comparative Perspective: An Overlooked Relationship”, *Nature and Culture*, 7:3, 314-337

Jorgenson, Andrew K., B. Clark, R.P. Thombs, J. Kentor, J. E. Givens, X. Huang, H. El tinay, D. Auerbach, M. C. Mahutga (2023), “Guns versus Climate: How Militarization Amplifies the Effect of Economic Growth on Carbon Emissions”, *American Sociological Review,* 88:3, 418-453

Kari De Pryck [ed.] (2022), “*A Critical Assessment of the Intergovernmental Panel on Climate Change*”, Cambridge University Press

Kolmas, Michal (2023), “The Failure of CBDR in Global Environmental Politics”, *Global Environmental Politics*, 23:1, 11-19

Lawford-Smith, Holly and A. Eriksson (2020), “*A*re States Responsible for Climate Change in Their Own Right*?*”, in “*The Routledge Handbook of Collective Responsibility*” [Saba Bazargan-Forward and Deborah Tollefsen eds.], 461-471

Lovell, H. and D. MacKenzie (2011), “Accounting for Carbon: The Role of Accounting Professional Organizations in Governing Climate Change”, *Antipode*, 43:3, 704-730

Lovell, Heather, T. Sales de Aguiar, J. Bebbington, J. and C. Larrinaga (2010), "Accounting for carbon", ACCA Research Report, 122

Lucas, Adam (2021), "Risking the earth Part 1: Power politics and structural reform of the IPCC and UNFCCC", *Climate risk management*, 31, 100260

Lucas, Adam (2021), "Risking the earth Part 2: Power politics and structural reform of the IPCC and UNFCCC", *Climate Risk Management*, 31

Lucas, Adam (2021), "Risking the earth Part 2: Power politics and structural reform of the IPCC and UNFCCC", *Climate risk management*, 31, 100260

Mahoney, James (2000), "Path Dependence in Historical Sociology", *Theory and Society*, 29:4, 507-548

Mahony, Martin and M. Hulme (2018), "Epistemic geographies of climate change: Science, space and politics", *Progress in Human Geography*, 42:3, 395-424

Martinez Romera, Beatriz (2016), "The Paris Agreement and the Regulation of International Bunker Fuels", *Review of European Community & International Environmental Law*, 25:2, 215-227

Matz-Lück, Nele (2009), "Framework Conventions as a Regulatory Tool", *Goettingen Journal of International Law*, 1:3, 439-458

Mayer, Benoit (2018), "The International Law on Climate Change", Cambridge University Press

Meinshausen, Malte, J. Lewis, C. McGlade, J. Gutschow, Z. Nicholls, R. Burdon, L. Cozzi, B. Hackmann (2022), "Realization of Paris Agreement pledges may limit warming just below 2°C", *Nature*, 604, 304-309

Meng, Bo, Y. Liu, Y. Gao et al. (2023), "Developing countries' responsibilities for CO2 emissions in value chains are larger and growing faster than those of developed countries*", 50 One Earth*, 6:2, 167-181

Michaelowa, Axel and T. Koch (2001), "Military Emissions, Armed Conflicts, Border Changes and the Kyoto Protocol", *Climatic Change*, 50, 383-394

Miller, Clark (2001), “Hybrid management: boundary organizations, science policy, and environmental governance in the climate regime”, *Science, Technology, & Human Values*, 26:4, 478-500

Pauw, Pieter., C. Brandi, C. Richerzhagen, S. Bauer, H. Schmole (2014), “Different perspectives on differentiated responsibilities: a state of-the-art review of the notion of common but differentiated responsibilities in international negotiations”, Discussion Paper, No. 6, Deutsches Institut für Entwicklungspolitik (DIE)

Prys-Hanse, Miriam (2020), “Differentiation as Affirmative Action: Transforming or Reinforcing Structural Inequality at the UNFCCC?”, *Global Society*, 34:3, 353-369

Rajaeifar, Mohammad A., O. Belcher, S. Parkinson, et al. (2022), “*Decarbonize the military – mandate emissions reporting*”, *Nature*, 611:7934, 29-32

Rajamani, Lavanya (2000), “The Principle of Common But Differentiated Responsibility and the Balance of Commitments under the Climate Regime*”*, *Review of European, Comparative & International Environmental Law*, 9:2, 120-131

Roberts, J. T., and B.C. Parks (2009), “Ecologically Unequal Exchange, Ecological Debt, and Climate Justice: The History and Implications of Three Related Ideas for a New Social Movement”, *International Journal of Comparative Sociology*, 50:3-4, 385-409

Ruffini, Pierre Bruno (2018), “The Intergovernmental Panel on Climate Change and the science-diplomacy nexus”, *Global Policy*, 9, 73-77

Shackley, Simon and B. Wynne (1995), “Integrating knowledges for climate change: pyramids, nets and uncertainties”, *Global Environmental Change*, 5:2, 113-126

Shaw, Alison, and J. Robinson (2004), “Relevant but not prescriptive: science policy models within the IPCC”, *Philosophy today*, 48:Supplement, 84-95

Sparrevik, Magnus and S. Utstøl (2020), “Assessing life cycle greenhouse gas emissions in the Norwegian defence sector for climate change mitigation”, *Journal of Cleaner Production*, 248, 119196

Turnhout, Esther, W. Tuinstra and W. Halffman (2019), “Environmental expertise: connecting science, policy and society” *Cambridge University Press*

Van Dijk, Teun A. (2015), “Critical discourse analysis”, *The handbook of discourse analysis*, 466-485

Victor, David (2015), “Climate change: Embed the social sciences in climate policy”, *nature*, 520:7545, 27-29

Victor, David G., R. Gerlagh and G. Baiocchi (2014), “Getting serious about categorizing countries”, *Science*, 345:6192, 34-36

Vihma, Antto and K. Kulovesi (2012), “Strengthening Global Climate Change Negotiations: Improving the Efficiency of the UNFCCC Process”, *Nordic Working Papers*

Vogler, Anselm (2024), “On (In-)Secure Grounds: How Military Forces Interact with Global Environmental Change”, *Journal of Global Security Studies*, 9:1, ogad026

Whitington, Jerome (2016), “Carbon as a Metric of the Human”, *PoLAR: Political and Legal Anthropology Review*, 39:1, 46-63

Yona, Leehi, B. Cashore and M. A. Bradford (2022), “Factors influencing the development and implementation of national greenhouse gas inventory methodologies”, *Policy Design and Practice*, 5:2, 197-225

Grey literature

Cottrell, Linsey and E. Darbyshire (2021), “The Military's Contribution to Climate Change”, *Conflict and Environment Observatory*

Cottrell, Linsey, E. Darbyshire and D. Weir (2022), “A framework for military greenhouse gas emissions reporting”, *Conflict and Environment Observatory*

Cottrell, Linsey, S. Parkinson (2022), “Estimating the Military’s Global Greenhouse Gas Emission”, *Scientists for Global Responsibility* and *Conflict and Environment Observatory*

Green Korea United (2022), “군대는 기후위기 대응의 사각지대인가 (Is the military a blind spot in the climate crisis response?)”

Hermann, Burkely [ed.] (2022), “National Security and Climate Change: Behind the U.S. Pursuit of Military Exemptions to the Kyoto Protocol”, *National Security Archive*, 784

Lin, Ho-Chih and D. Burton (2020), “INDEFENSIBLE: The true cost of the global military to our climate and human security”, *Tipping Point North South*

Lorca Arce, Aida, L. Evergreen and S. Simić (2022), “Climate of Change – Reshaping Military Emissions Reporting”, *OSCE*

McManus, K. (2009), “The principle of “common but differentiated responsibilities” and the UNFCCC”, *Climatico Special Features*

Michaelowa, Axel, T. Koch, D. Charro, C. Gameros, D. Burton, H. C. Lin (2022), “Military and conflict-related emissions: Kyoto to Glasgow and Beyond”, *Perspectives Climate Group* and *Tipping Point North South*

Semler, Stephen (2023), “A Climate-friendly Military is a Better Military”, *Outrider*

Van Schaik, Luise, P. Laboué, K. Kertysova, A. Ramnath, D. van der Meer (2022), “The World Climate and Security Report 2022: Decarbonized Defense - Combating Climate Change and Increasing Operational Effectiveness with Clean Military Power, The Need for Clean Military Power in the Age of Climate Change”, Erin Sirkosky and Francesco Femia [eds.], *International Military Council on Climate and Security*

News Articles

Gady, Franz-Stefan (2018), “US, South Korea Kick Off Annual Military Drill Without US ‘Strategic Assets’”, *The Diplomat*

Haas, Benjamin (2018), “South Korea and US resume military drills ahead of nuclear talks”, *The Diplomat*

Warrick, Joby (1997), “Kyoto Pact Includes a Pentagon Exemption”, *The Washington Post*

Essig, Blake (2021), “As regional tensions rise, Japan’s ground troops hold their first military drills in decades”, *CNN*

Naval News Staff (2023), “US Approves Additional E-2D AEW Aircraft For Japan”, *Naval News*

Conferences

Leaders’ Summit on Climate, available at https://www.state.gov/leaders-summit-on-climate/

Proceedings of the first Military Emissions Gap Conference, available at https://ceobs.org/proceedings-of-the-first-military-emissions-gap-conference/

Consulted Websites

COP 28 Website – opening speech https://www.cop28.com/en/news/2023/11/COP28-President-DrSultan-Al-Jabers-Opening--Plenary-Speech

IPCC Website https://www.ipcc.ch

List of exercises conducted by the Japan Maritime Self-Defense Forces (JMSDF) https://www.mod.go.jp/msdf/en/exercises/

List of pamphlets published by the Japanese Minister of Defense which include reports of military drills https://www.mod.go.jp/en/jdf/back_issues

Press Release of the UN https://press.un.org/en/2024/sgsm22168.doc.htm

Press Release of the UNFCCC https://unfccc.int/es/node/634255

The Military Emissions Gap https://militaryemissions.org